MILITARY TRUCKS
• ARCHIVE •

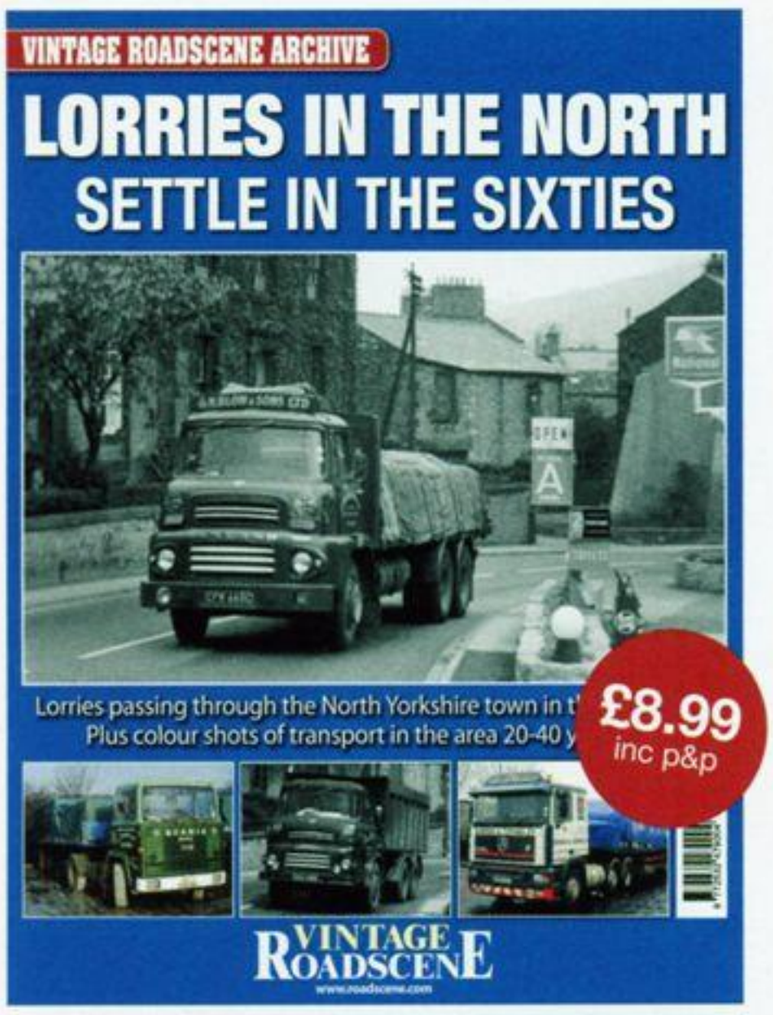
THORNYCROFT ANTAR

MORE THAN **175** RARE IMAGES

THE STORY OF BRITAIN'S THIRD-GENERATION TANK TRANSPORTER!

VOLUME 1 £8.99 WWW.KELSEY.CO.UK
9 772633 712001 01

VINTAGE ROADSCENE ARCHIVE



ON SALE NOW!

LORRIES IN THE NORTH

A LOOK BACK AT THE VEHICLES WORKING ON THE ROADS IN THE NORTH OF ENGLAND DURING THE 1960S

This publication features a look back at commercial vehicles working on the roads of the North of England during the mid-1960s, using nearly 200 of an enthusiast's photographs, showing them making their way through the town of Settle on the A65, then and now an important cross-country and alternative north-south route. In addition there are another 100 or so colour pictures of lorries from the 1970s to the 1990s, offering memories of many well-known operators and their vehicles.

Please note: *'Vintage Roadscene Archive'* is a continuation of the previous *'Road Haulage Archive'* series and this is the 27th title published so far. You can buy individual copies at WH Smith and other high street retailers, order singles copies, including back issues, from the publisher, or take out a subscription and save 25% on the shop price.

BACK ISSUES - buy online at shop.kelsey.co.uk/rhaback

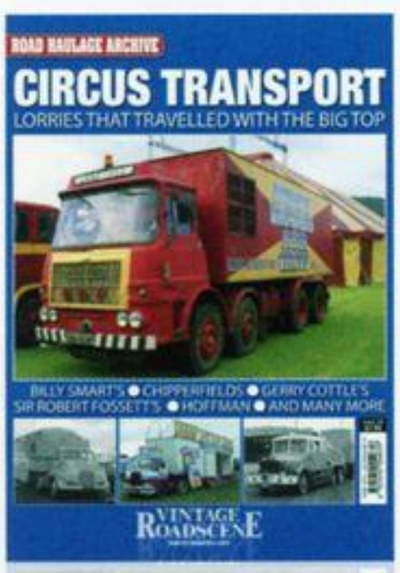
Road Haulage Archive series (1-25)

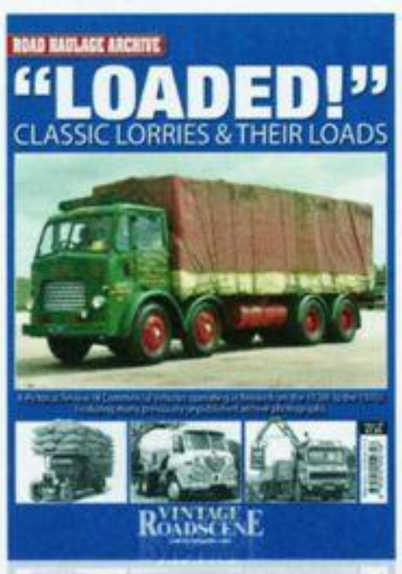
Issue 7 Red Van, Green Van (Post Office) £7.95
Issue 8 Heavy Haulage £7.95
Issue 9 The Rare Ones (lesser known makes) £7.95
Issue 11 Tanks for Everything (road tankers) £7.95
Issue 12 Circus Transport £7.95
Issue 13 The Light Brigade (vans & pick-ups) £7.95
Issue 14 Tipping the Balance (tipper lorries) £7.95
Issue 15 Through Irish Eyes (Irish RT) £7.95
Issue 16 Timewarp Transport (Malta) £7.95
Issue 17 Body Language (CV bodywork) £7.95
Issue 18 Well-Known Names £7.95
Issue 19 Loaded! (classic loads) £7.95
Issue 20 Parcels, Polish & Pipes (driver reminiscences) £7.95
Issue 21 Selling Lorries the early 1950s £7.95
Issue 22 Here's One We Sold Earlier £7.95
Issue 23 Selling Lorries the late 1950s £8.99
Issue 24 Scammells manufacturer's pictures £8.99
Issue 25 Rallies now and then £8.99

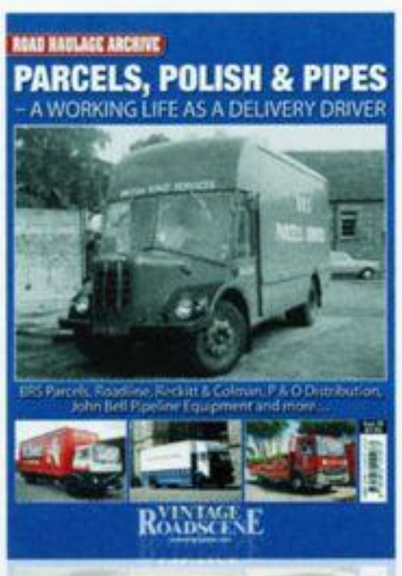
NEW SERIES

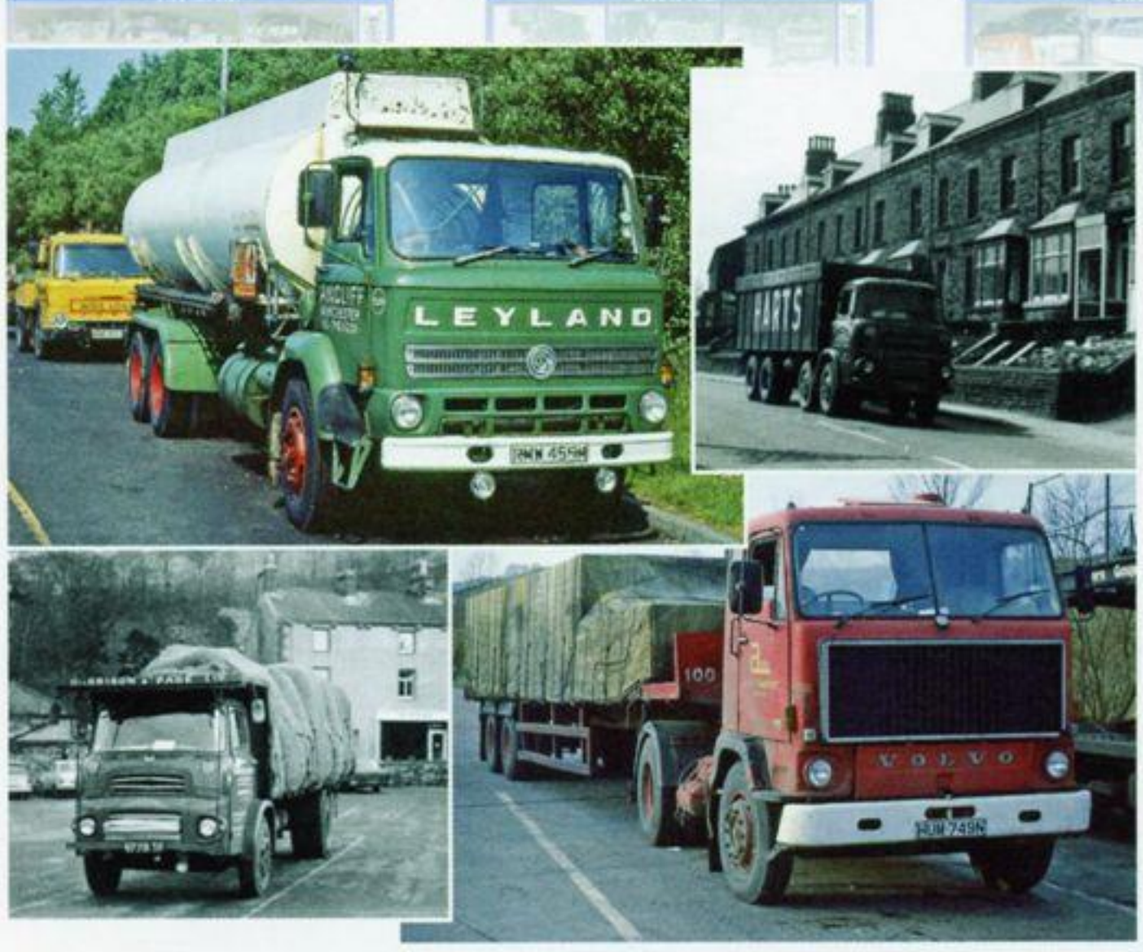
GUY The Good Guys £8.99
COMMER & KARRIER Rootes Group £8.99

All prices include postage & packaging to addresses in the UK, see foot of page for overseas price information









SAVE OVER 25% WHEN YOU SUBSCRIBE!

6 issues per year for £39.99, post & packaging included, saving over 25% on the price in the shops

You can order any of the above by going on line or by telephoning our customer services department;

ON LINE
Current Issue and Back Issues go to
http://shop.kelsey.co.uk/rhaback

To subscribe go to **http://shop.kelsey.co.uk/rha25**

TELEPHONE (in all cases)
Call: **01959 543 747** – lines are open Mon-Fri 8.30am-5.30pm

For overseas rates and prices please go to
http://shop.kelsey.co.uk/rha

MILITARY TRUCKS ARCHIVE

CONTENTS

● Antar Mk 3 fifth-wheel tractor (FV12004) nosing gently out of Base Workshop 23, Royal Electrical and Mechanical Engineers (REME); Centurion tanks are carried on the FV3011 50-ton semi-trailers. Alongside its three workshop areas, Base Workshop 23 had the largest Royal Army Ordnance Corps (RAOC) stores section in the entire army. The base was located at Wetter, in the federal state of North Rhine-Westphalia, on a 50-acre site formerly belonging to the Harkort-Eicken Steel Works, and closed in March 1994.

Compiled and written by Pat Ware with source material from the Warehouse Archive
Special thanks to Richard Grevatte-Ball and the Thornycroft Society

Designer: Mark Hyde
Digital image restoration: Lizzie Ware
Publisher: Paul Appleton
Marketing: Rebecca Gibson

Published by Kelsey Publishing Ltd, The Granary, Downs Court, Yalding Hill, Yalding, Kent, ME18 6AL
Telephone 01959 541444, Fax 01959 541400, www.kelsey.co.uk

Distributed by Seymour Distribution Ltd
Printed by Pensord Press Ltd, Tram Rd, Pontllanfraith, Blackwood NP12 2YA

ISBN 977-2633712-00-1-01

KELSEYmedia

INTRODUCTION

The Mighty Antar... Britain's biggest tractor!

When the Mighty Antar first appeared in the spring of 1950, it was Thornycroft's proud boast that here was 'Britain's biggest tractor'... even 'Commercial Motor' magazine agreed, in its edition of 3 March 1950 describing it as 'the largest tractor produced in this country' Powered by a diesel version of the Rover Meteorite engine, producing 250bhp from its 18 litres, the massive Antar was designed to operate at a gross train weight of up to 100 tons (101.8 tonnes).

The Antar was commissioned by the civil-engineering contractor George Wimpey & Sons on behalf of the Iraq Petroleum Company (IPC). A total of 35 of these tractors were eventually supplied, at a price of £9000 each, and the total cost of the contract was £315,000, equal to more than £10 million at 2019 values. The trucks were specifically intended for laying out large-diameter steel pipes – 'stringing' as it is called in the oil industry – across the, largely, desert terrain of Iraq and Syria.

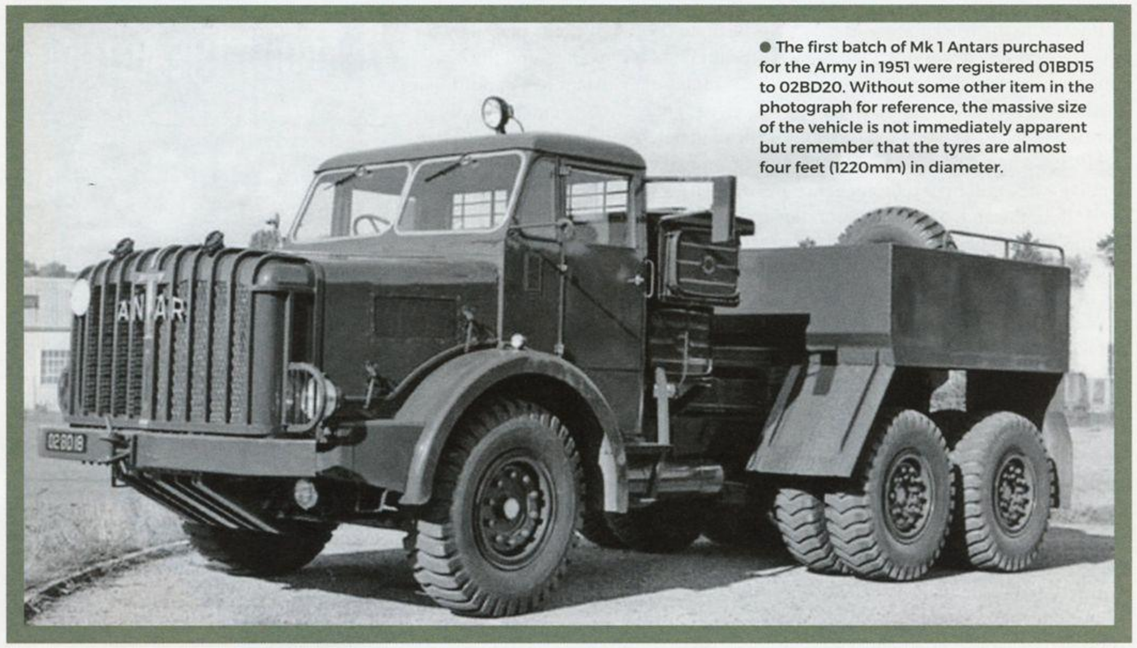
In what remains an amazing feat, it had taken just ten months to produce the Antar prototype, and all 35 trucks had been constructed by the following year, and delivered to the Middle East where they were put to work on the Homs to Kirkuk pipeline.

The pipeline in question was to run across 550 or more miles (890km) of desert and scrubland. In some places, the terrain rose to a height of more than 3300 feet (1006m), and some 250 miles (405km) of the distance was nothing more than tracks across the sand. If the terrain was challenging enough, the climate was pitiless, dropping below zero at night in the winter, and reaching more than 48°C (118°F) in the summer. Local, generally Syrian, drivers were used, who, by all accounts, lacked any mechanical sympathy, and were merciless in their abuse of the trucks, occasionally running them to destruction without oil or water.

Each of the 30-inch (762mm) diameter pipeline sections measured more than 30 feet (9.15m) in length and weighed up to 15,000 lb (681kg). And each of the vehicles was expected to carry a load of 60 tons (61.1 tonne) per trip, consisting of up to ten lengths of pipe on the specially-constructed Cranes semi-trailers. It required eight Antars to carry one mile of pipe.

As the Antars were put to work in the Middle East, the Ministry of Supply and the War Office had started to show

● Mk 1 FV12001 steel-bodied ballast tractor, photographed at the Thornycroft works. Although the registration number (47AN09) is scarcely visible, the two-tone colour scheme identifies the tractor as one of a batch of eight purchased for the RAF in 1955.



● The first batch of Mk 1 Antars purchased for the Army in 1951 were registered 01BD15 to 02BD20. Without some other item in the photograph for reference, the massive size of the vehicle is not immediately apparent but remember that the tyres are almost four feet (1220mm) in diameter.

● A ballast-bodied Antar Mk 3 dwarfs a Triumph Herald. The Mk 3 omitted the distinctive side-by-side radiators of the Mk 1 and Mk 2 tractors, and was fitted with a widened version of the standard Thornycroft cab of the period. The result was a considerably more attractive vehicle.

an interest in the truck for use as a tank transporter. It was intended as a temporary replacement for the ageing wartime Diamond Ts, and maybe to eventually steal the role of the FV1000 and FV1200 heavy tractors that, at the time, were still in development at Leyland. In the end, neither FV1000 nor FV1200 made it beyond the prototype stage, and the Antar, produced in three marks, eventually clocked up more than 30 years military service.

It might seem odd to describe such a vehicle in terms of its appearance, but, whilst the Mk 1 and Mk 2 variants have a tough, no-nonsense appearance, the Mk 3 can be considered a very attractive machine. Not only was it easily able to equal the appearance of the WW2 Diamond T that it replaced... but, at the same time, provided a considerably improved performance.

But, time marches on, and tanks just continued to get bigger and heavier. The new Challenger tank, destined to enter service in the early 'eighties, weighed 62 to 70 tons (63.1 to 71.3 tonnes) and, sadly, the Antar was not considered to be up to the job. It was replaced by the Scammell Commander, and the last examples of the Antar left Bulford Camp, on 30 January 1985, ignominiously loaded onto semi-trailers – hauled by Scammell Commanders – en-route to British Car Auctions at Farnborough for disposal.

More than 35 years have passed since then, and Thornycroft has gone the way of the entire British commercial-vehicle industry. But a handful of Antars have survived... some are in the hands of museums, others belong to brave – or foolhardy – enthusiasts. If you don't have access to the real thing, then hopefully this walk down memory lane will remind you of the time when British trucks were amongst the best in the world.

Pat Ware
Series editor

ABOUT THE AUTHOR

Pat Ware has been a professional writer for more than 50 years. He is the author of more than 60 vehicle-related titles, and has specialised in military-vehicle subjects since 1995. His expertise is recognised worldwide, and his books have been translated into a half-dozen languages.

In 2001, he was the founding editor of the UK's leading military vehicle magazine, '*Classic Military Vehicle*' and he continues to contribute to respected military-vehicle journals in the USA and France, and in 2015 he contributed to a 10-part TV show, '*War on Wheels*' for China Central Television.

His eclectic interests have also led to the publication of titles on subjects as diverse as the Cold War, commercial haulage and iconic tractors.

● Three-quarter rear view of the Mk 3A fifth-wheel tractor. Note how the tailpipe sections of the twin exhausts have been removed to allow this privately-owned Antar to fit into its storage building. The tubular-steel framework behind the cab is intended for a canvas cover, both to weatherproof the winch and to provide simple overnight accommodation for the crew.

DEVELOPMENT

George Wimpey, the Iraq Petroleum Company and the Mighty Antar

On 22 February 1950, around 90 invited guests, drawn mainly from government departments and international oil exploration companies, gathered at the test track of the Fighting Vehicles Research & Development Establishment (FVRDE) at Bagshot Heath, Surrey to see the recently-completed Mighty Antar put through its paces. They were joined by 50 members of the staff of Transport Equipment (Thornycroft), Cranes of Dereham, the Rover Company, George Wimpey, and the owners of the truck, the Iraq Petroleum Company. The event was filmed by the BBC and by the cinema newsreel companies of the day; representatives of the trade press were also present.

Constructed in double-quick time over a period of just ten months, the Mighty Antar was a most impressive piece of work. It was also a considerable achievement, particularly when you consider that, not only was this the largest truck ever constructed by Thornycroft, it was also the largest vehicle built in Britain up to that time. Believing that the new, monster truck had a bright future, RF Newman, general manager of Thornycroft, went on the record claiming that 'there was an opportunity for this country to save dollars by selling this transport to oil companies' In the long run, he was proved to be right, the Antar succeeded beyond the company's wildest expectations. But rather than the oil companies that he had envisaged as the customer base, the Antar turned out to be destined for a career in uniform.

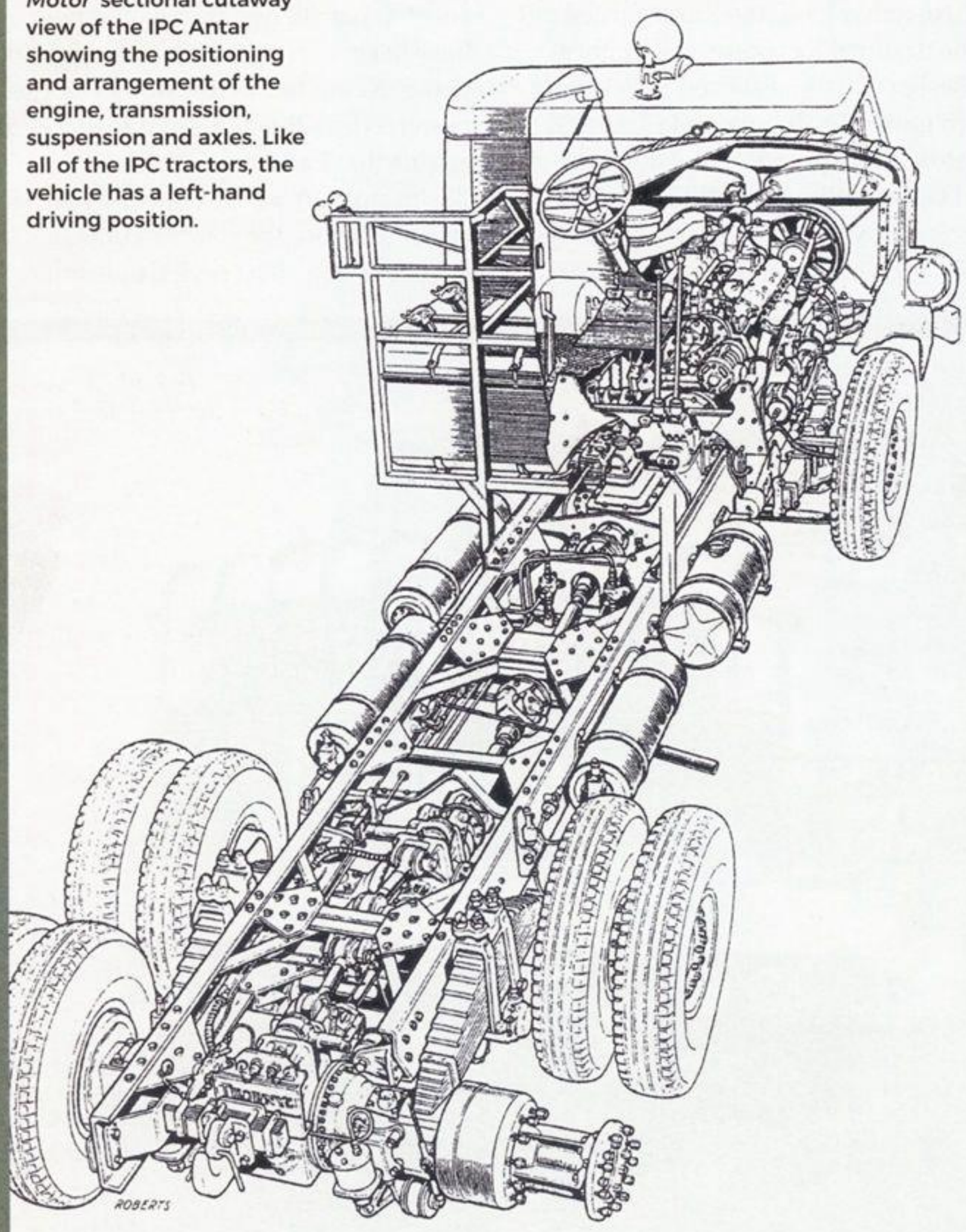
Design work had started in February 1949 under the direction of Charles E Burton, Thornycroft's chief designer, and George Wimpey placed the order for 35 heavy tractors in April of the same year, on behalf of the British-owned Iraq Petroleum Company. Quite why Wimpey had originally approached Thornycroft rather than the more obvious choice of Scammell remains a mystery, particularly since Scammell had already breached the 100-ton barrier and thus would not have been starting with a clean sheet of paper. Nevertheless, the first prototype, powered by a Rover Meteorite diesel engine that had been delivered to Basingstoke on 22 November 1949, was running before the year was out.

Following a short period of testing,

● The first Mighty Antar undergoing initial trials at the FVRDE test site at Bagshot Heath before being delivered to the Iraq Petroleum Company. The enormous width of the vehicle is apparent... and is clearly marked. The tractor has yet to receive its coats of finishing paint.

● Coupled to a Cranes low-loading machinery semi-trailer, this IPC Antar was photographed in March 1950 in front of the Regal Cinema, Edmonton. The tractor is on its way to the docks at Tilbury, and the police have stopped the traffic to allow the tractor and trailer to negotiate the turn onto the A406 North Circular road.

● Superb '*Commercial Motor*' sectional cutaway view of the IPC Antar showing the positioning and arrangement of the engine, transmission, suspension and axles. Like all of the IPC tractors, the vehicle has a left-hand driving position.



much of it carried out on the FVRDE test tracks, the truck was driven to the docks at Tilbury ready for delivery to Tripoli on 6 April 1950. On arrival in the Libyan port, the vehicle was photographed, tested and vetted before being put to work. Each of the 35 trucks received similar treatment following delivery to Libya.

By any measure, the Antar was a huge machine. Everything about it was over-sized and yet it was undeniably handsome, albeit more strait-laced than flashy, but with considerable road presence. The frontal aspect was dominated by the broad, twin radiators, and a massive square bonnet, under which was an eight-cylinder Rover Meteorite indirect-injection twin-camshaft diesel engine. The engine was capable of producing a derated 250bhp (186kW) from its 18-litre capacity, at a maximum of 2000rpm.

Sharing a 60° dimension between the cylinder banks, the engine was effectively two-thirds of the V12 Meteor – a non-aeronautical version of the famed Merlin – that had been developed for use in the British Conqueror and Centurion tanks of

the period, and in what was described as Mk 101 configuration, it was the first commercial application for the Meteorite power unit. The original Meteor was a petrol engine, but the Meteorite, as used in these first Antars, had been adapted to burn diesel fuel using CAV injection equipment. The crankcase, cylinder block, and cylinder heads were all cast from aluminium alloy, and there was a flame heater to permit starting in cold conditions. Lubrication was by means of a dry sump, which allowed the vehicle to operate at extreme angles without any fear of oil starvation, and an oil cooler was mounted in front of the right-hand radiator.

The engine was coupled to a remote four-speed constant-mesh main gearbox, via a twin-plate 18-inch power-assisted clutch, together with a three-speed auxiliary box, giving a total of 12 gears. Double worm-drive reduction axles at the rear were provided by Kirkstall Forge Engineering, with a third differential interposed between the two axles. The front axle was a simple beam design, lacking any drive facilities. Top speed on the road was governed to 28mph (45.3km/h), and it took almost a minute and a half to get there! When operated at home, the truck would have been subject to a blanket 12mph (19.4km/h) speed limit because of its size and weight.

Both the brakes and the steering system were power assisted, the former with air pressure, the latter hydraulics, using equipment developed by Clayton Dewandre.

The suspension arrangements followed the normal practice of the period, with heavy semi-elliptical multi-leaf springs, inverted at the rear and fitted with substantial rubber-bushed torque-reaction arms. The rear axles were arranged to allow a rise and fall of 15 inches (381mm), allowing uneven ground to be crossed without undue difficulty, and rubber bump stops and steel slings were provided to limit axle deflection. The massive tyres, each one almost four feet in diameter and weighing 5cwt (254kg), were specially made for this application since tyres of this size had never previously been required in Britain.

Although equally massive, the chassis was of straightforward design, consisting of huge channel-section side members of heat-treated steel, measuring 11.125 x 3.5in (283 x 90mm), with a full length liner, and with reinforcing plates at the rear. There were diagonally-braced bolted cross-members, and a fifth wheel was carried on the top of the chassis.

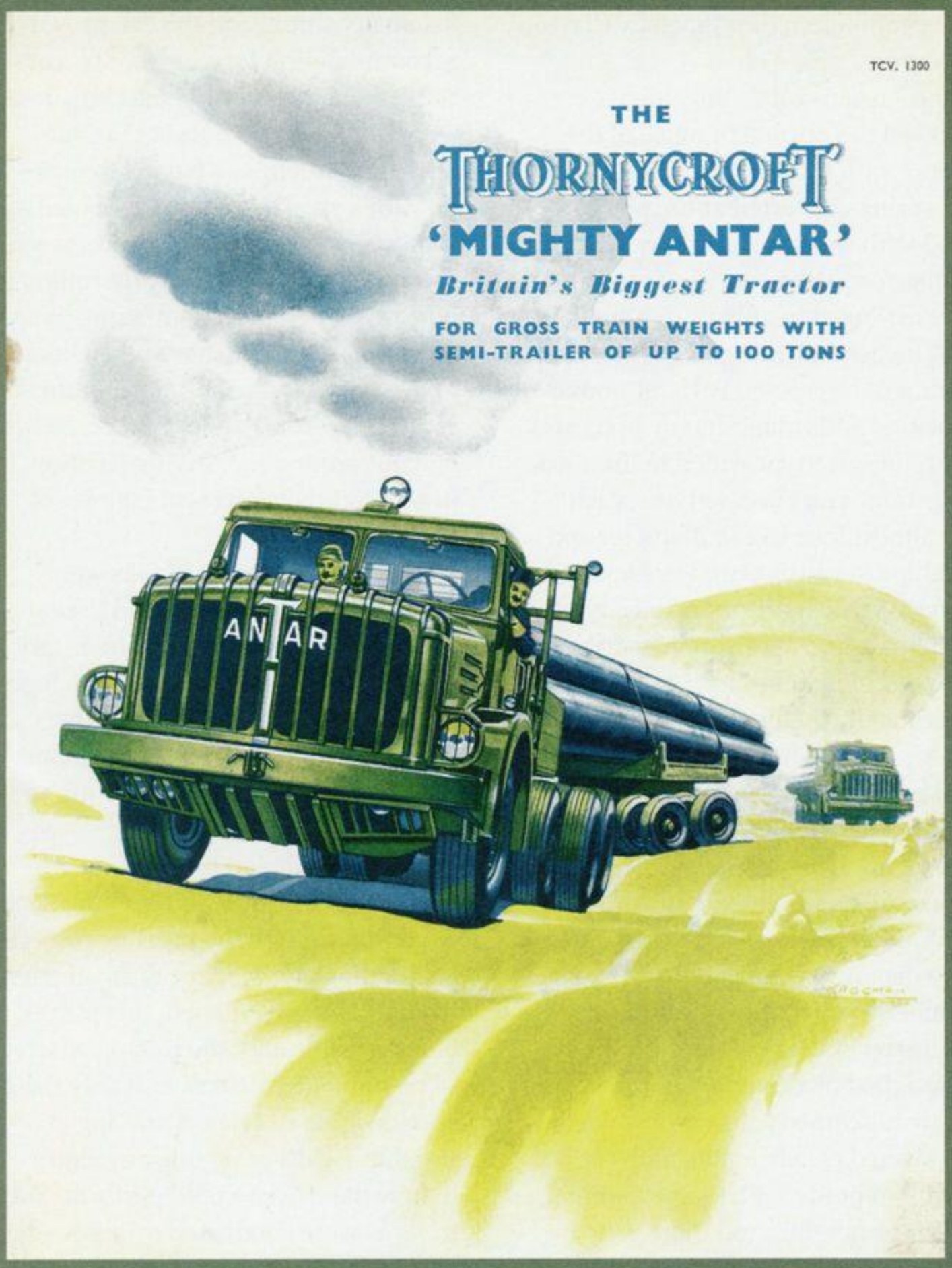
Designed by Comjoints Limited, the twin-skinned cab was of welded and riveted construction, and was flexibly-mounted. Flat panels were used wherever possible and there were no compound curves; full-length hinged doors were fitted on either side, with drop-down glazing. All of the IPC trucks were constructed with a left-hand driving position, and the cab provided accommodation for a crew of two or three men, the driver being provided with an adjustable bucket seat, the other crew members having to make do with a small bench that doubled as a storage locker. Instrumentation was comprehensive, including thermometer, oil-pressure gauge, air-pressure gauge, ammeter, speedometer, and tachometer. Major controls, such as the handbrake, gear-shift levers, trailer brakes, etc were laid out around the driving position in the slightly haphazard manner of the period.

Twin 100-gallon fuel tanks were mounted side by side behind the cab... a necessary precaution when fuel stations are few and far between, and the fuel consumption was generally in the order of 3 to 3.5mpg (1.06 to 1.24km/litre), giving a range of about 600 miles (1000km).

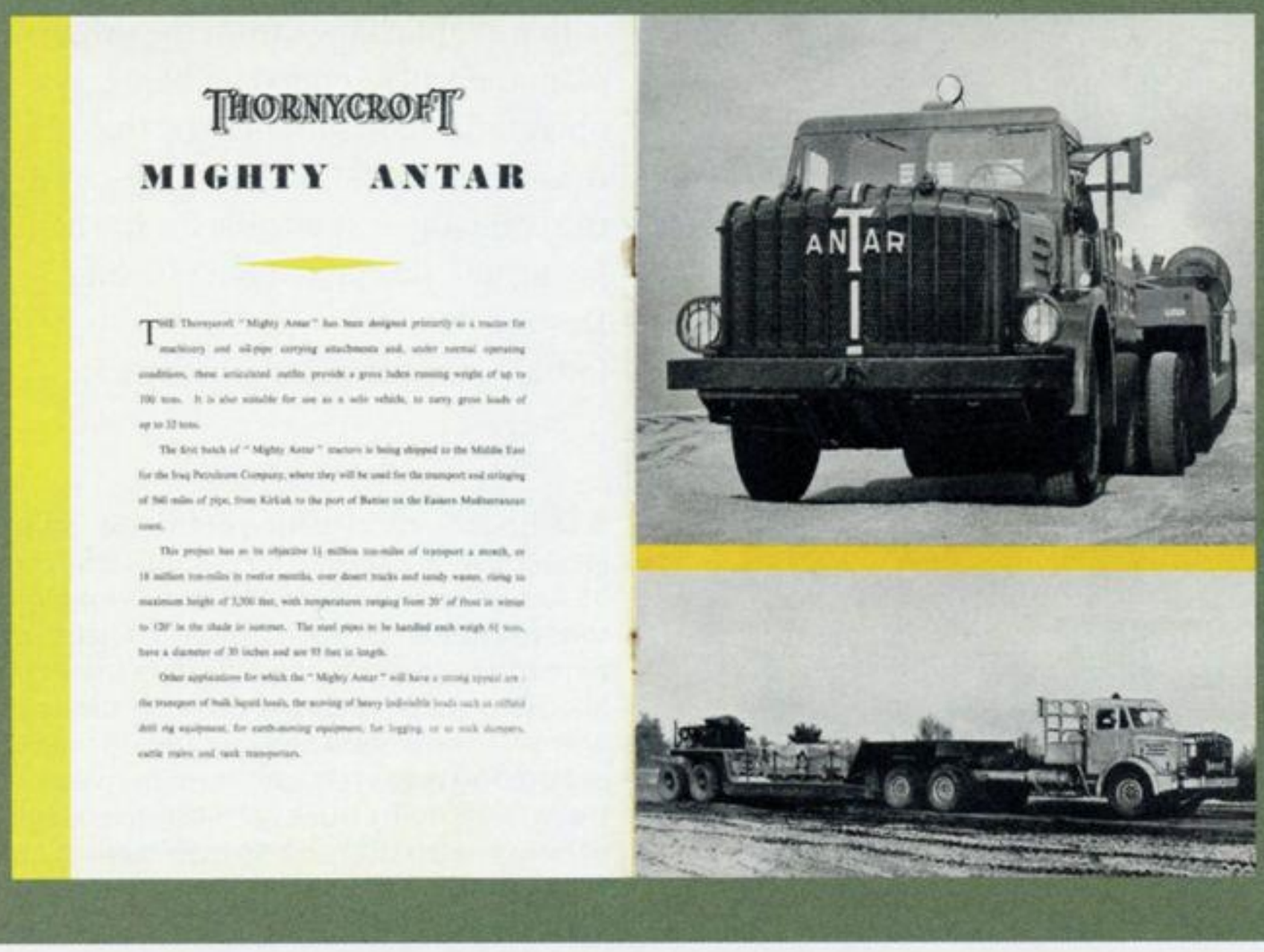
The original plan had been to thoroughly test the vehicle under service conditions before the pipeline project started in order to identify any teething troubles. As it happened, this proved to be impossible and, the tractors started to be shipped overseas with only the results of the restricted running at Bagshot Heath providing any clue as to how the trucks would perform. Such trials as were conducted over a 10-day period, covered less than 10,000 miles (16,200km) but, nevertheless, the Antar acquitted itself extremely well and the engine, particularly, was considered to be capable of performing its task with little or no modification.

In a slight change from the original plan, the trucks ended up being operated and maintained by the Arabian Bechtel Company, who were the company responsible for the actual laying and welding of the pipeline. Despite the workshop conditions being initially unsatisfactory, the trucks

● During the construction of the 556-mile (900km) long Homs to Kirkuk pipeline, the 35 Antars were expected to carry a load of 63 tons (64 tonne) on each trip, and it needed nine trucks to move one mile (five trucks per kilometre) of pipe. By the time the project was over, the Antars had clocked up in excess of 700,000 miles (1,134,000km) between them, with many trucks achieving mileages of between 20,000 and 30,000 miles (32,000 and 48500km) under extremely arduous conditions.



● Thornycroft sales brochure (publication number TCV.1300) for the IPC Antar, dated March 1950. Much was made of the fact that the truck was the largest ever produced in Britain. The brochure was aimed at those who needed to move heavy indivisible loads including oilfield drilling rigs, large earth-moving equipment, or bulk liquids... it is only at the end of the text that it is suggested that the Antar might also be suitable for use as a tank transporter.



themselves proved to be sufficiently reliable to allow the project to be completed ahead of schedule... despite many trucks being sorely abused by their drivers.

Trailers

The special skeletal trailers intended for use with the Antar were designed and constructed by Cranes of Dereham specifically for this application. Conservatively rated at 50 tons, each trailer consisted of two separate frames, with rubber-lined cradles shaped to accept the 30-inch (762mm) diameter pipes. The front frame was mounted on the fifth-wheel turntable of the tractor, whilst the rear frame carried twin axles, each fitted with four wheels. Aside from the flexible piping for the airline to the rear brakes, the pipe sections provided the only connection between the two separate frames.

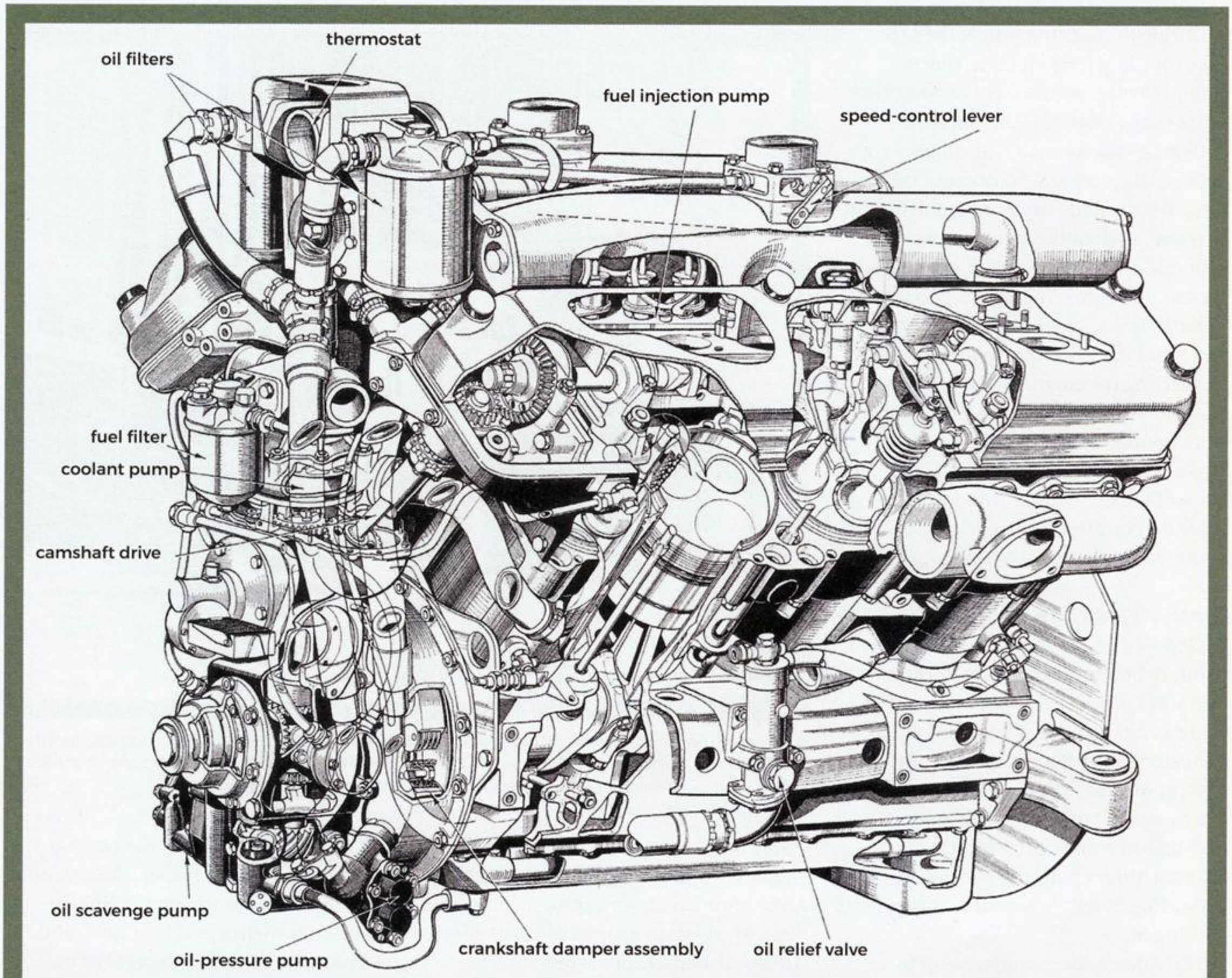
The maximum load was nine or ten pipe sections, stacked in three or four nested layers, four at the bottom, three in the middle, and two on top, with one more sometimes added to bring the figure up to ten. When the truck was running light, the trailer was carried on the tractor, with the forward frame reversed on the fifth wheel, and the rear frame was carried on top of it.

Photographs also exist showing the tractors coupled to Cranes low-loading machinery trailers.

Antars at work

In Iraq and Syria, the Antars were operated by Syrian native drivers. In some respects these men were the ideal choice since they were well used to the harsh climatic conditions of the region. In other respects they were a disaster... being described as 'merciless' in their operation of the trucks and lacking any mechanical knowledge or sympathy. Trucks were occasionally operated without oil or coolant and were sometimes run to destruction. There was also evidence of gross negligence and even of malicious damage.

In 1952, once the project was completed, the Field Service Department at Rover produced a report on the performance and maintenance requirements of the Meteorite engine. The report listed a litany of complaints regarding poor maintenance, which often led to engine failure, and also



● Sectional cutaway view of the Rover Meteorite V8 engine in Mk 101 form. Although originally designed as a petrol engine, when equipped with CAV indirect-injection equipment, and with a higher compression ratio, the Meteorite produced 250bhp at 2000rpm running on diesel fuel. The engine was derived from the V12 Meteor, a version of the Rolls-Royce Merlin designed for use in tanks.

made reference to damage caused by the trucks being driven too fast for the terrain. The report stated that by early September 1951, the position in the Middle East was so bad that just four trucks were available, with 22 off the road due to engine defects. Measures were put in place to emphasise the importance of proper maintenance, and a more reasonable maintenance schedule was instituted, and, eventually, all of the engines were in running condition, with a good stock of spare engines also available.

● IPC Antar photographed in Iraq, coupled to the special Cranes skeletal semi-trailer that was used to carry the pipe sections. The pipes were stacked by crane into three or four layers, with a maximum of 10 pipe sections carried on each journey.

DEVELOPMENT

During the construction of the 556 mile (900km) long pipeline, the 35 Antars clocked up in excess of 700,000 miles (1,134,000km) between them, with many trucks achieving mileages of between 20,000 and 30,000 (32,000 to 48,500km). Aside from the problems due to abuse, such difficulties as arose were generally minor in nature, including, for example, broken brackets and pipes, radiator leaks, silencer problems, and noise and vibration due to the jackshaft connecting the engine to the gearbox.

At the end of the project, the vehicles were handed over to Arabian Bechtel and around half of them found a longer lease of life being used with low-bed machinery trailers to haul construction equipment, plant and other stores.

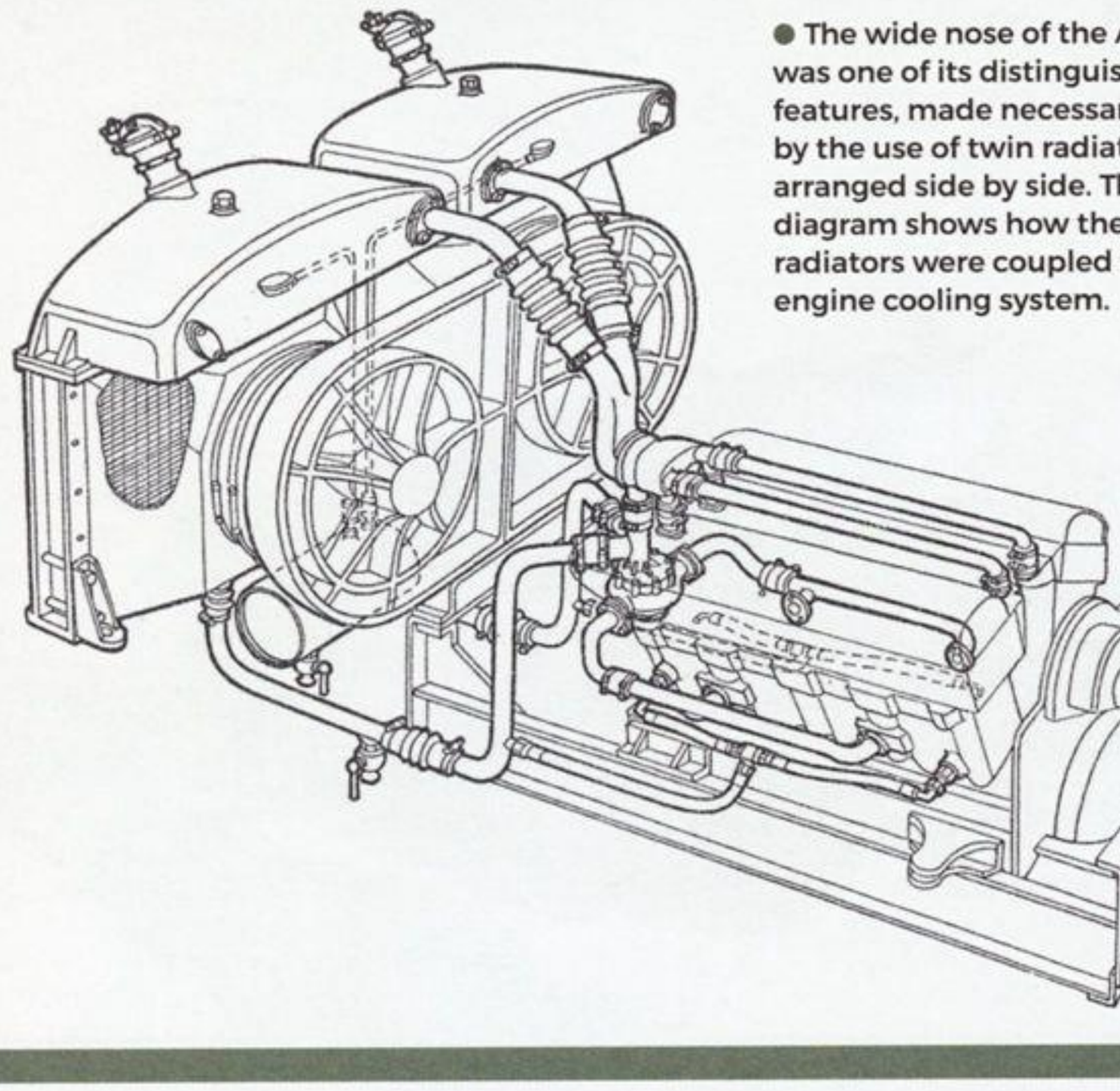
● Painted bright red with black mudguards and radiator detail, this IPC Antar was displayed at the Festival of Britain on London's South Bank in 1951. The tractor had already made its public debut at the Commercial Motor Show at Earl's Court the previous year.

From strength to strength

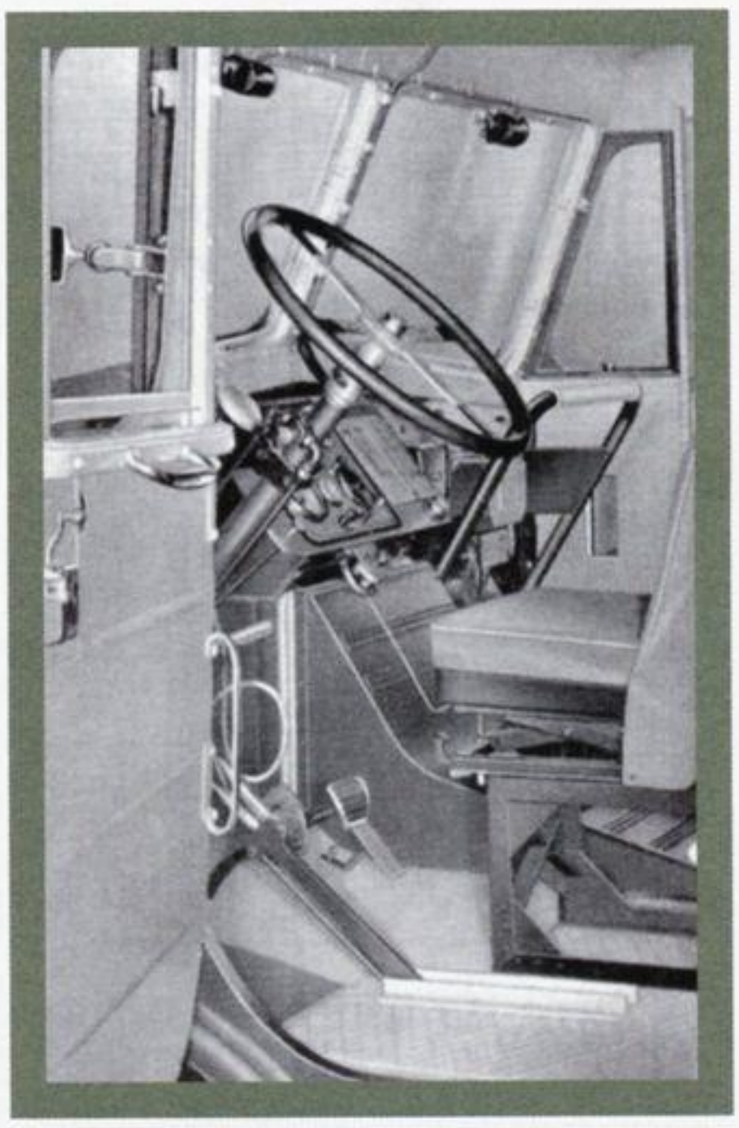
In September of 1950, the truck was exhibited at the Commercial Motor Show at Earls Court, where it dwarfed other vehicles on the stand and drew considerable attention. At the time, Britain was the world's leader in the export of commercial vehicles and British commercial vehicle manufacturers played a key role in bolstering Britain's economy throughout the 'fifties.

The Antar was also offered up to public scrutiny, when it appeared at the Festival of Britain on London's South Bank in the summer of 1951. The Festival, which opened to the public on the 4 May 1951, was a celebration of British industry, arts and science and the massive Antar must have been quite a sight for those who were more used to the modestly-sized British trucks of the period.

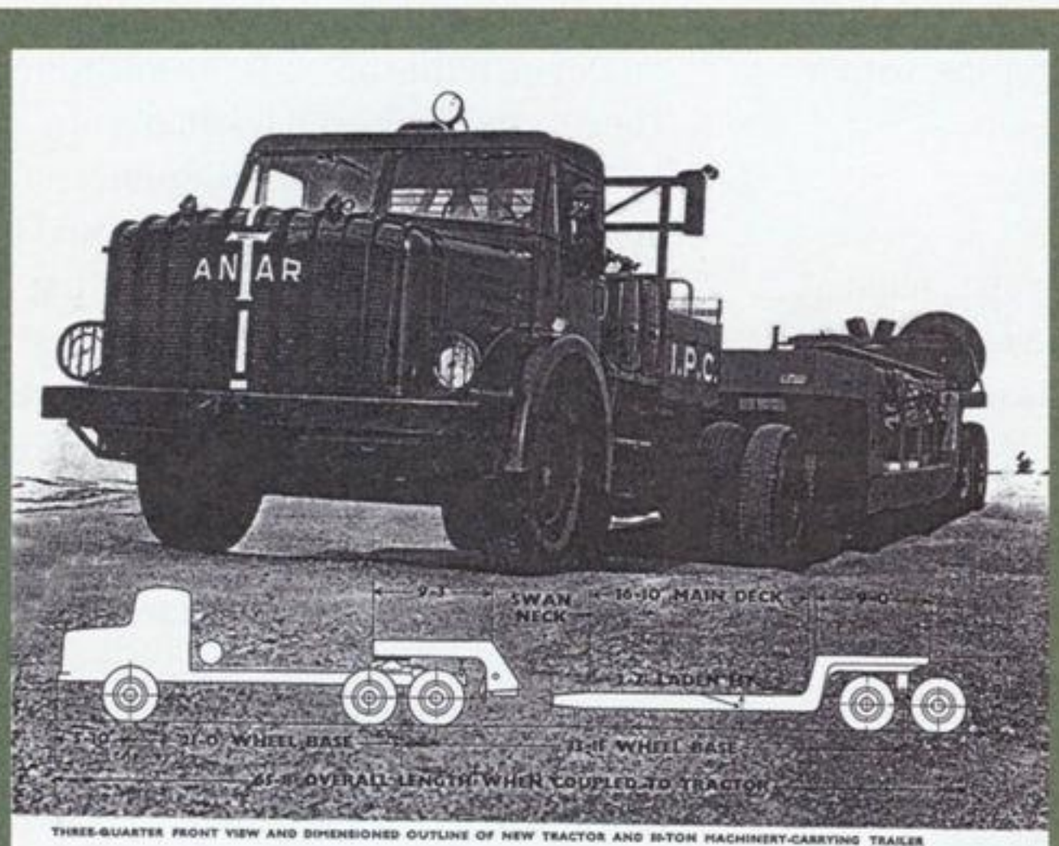
In 1953, Thornycroft announced a new, short wheelbase, ballast-box version of the Antar destined for export to Australia. Complete with a 120-ton Cranes hydraulically-suspended swan-neck drawbar trailer, the trucks were intended for use on the Snowy Mountains hydroelectric project, and were similar in many respects to the IPC tractors. With one tractor leading, and the other bringing up the rear, the outfit was tested, and demonstrated, in Britain by crews from Robert Wynn and



● The wide nose of the Antar was one of its distinguishing features, made necessary by the use of twin radiators, arranged side by side. This diagram shows how the radiators were coupled to the engine cooling system.



● Interior view of the cab, showing the left-hand driving position.



THREE-QUARTER FRONT VIEW AND DIMENSIONED OUTLINE OF NEW TRACTOR AND 50-TON MACHINERY-CARRYING TRAILER

"MIGHTY ANTAR"

Two specialist firms co-operate to produce Britain's largest vehicle

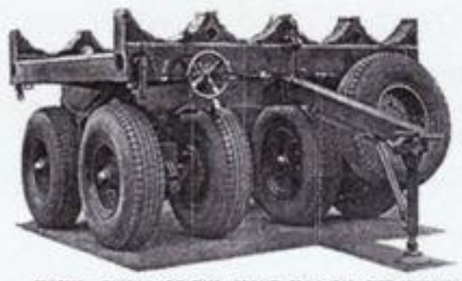
A NEW-TYPE tractor has been built for the Iraq Petroleum Co. for pipe-stringing in the Middle East, involving the transport and stringing of 560 miles of pipe from Kirkuk to the port of Banias on the Eastern Mediterranean coast. The project has as its objective 1½ million ton/miles (1,524 kg/km) of transport per month, or 18 million ton/miles (29,261 kg/km) in 12 months, over desert tracts and sandy wastes, rising to a maximum height of 3,500 ft (1,087 m), with temperatures ranging from 20 deg F (—11·1 deg C) of frost in the winter to 120 deg F (48·9 deg C) in the shade in summer. The tractors, which are built by Transport Equipment (Thornycroft), Ltd., are designed to operate with Crane semi-trailers specially manufactured for pipe carrying, with the addition of a single low-loading trailer of 50-ton (50,800-kg) capacity, which will be employed on the transport of oil-producing equipment.

The engine is a Rower Meteorite Mk. 101 60-deg V 8-cylinder type of 18-l capacity with a bore and stroke of 5·4 × 6 in (137 × 152 mm) derated to produce a maximum of 250 b.h.p. at the governed speed of 2,000 r.p.m. C.A.V. fuel injection equipment is fitted and dry sump lubrication is employed, with full pressure feed to the main and big end bearings, gudgeon pins, camshaft and overhead valve gear.

The radiator consists of two independent but interchangeable elements mounted side by side in the normal frontal position. Together they have a total water capacity of 26 gal (118 l) and below them a 4-gal (18-l) condensation tank is mounted to reduce wastage by evaporation. Cowls bolted behind each radiator element are connected to corresponding cowls on the engine block in which large-

Reprinted from BRITISH ENGINEERING *May 1950*

Ref.: TCV.1304



SPECIAL SADDLE OF THE CRANE 30-IN DIA PIPE CARRIER

diameter closely-fitting fans are driven, the connection being by a leather bellows-like ring to permit movement.

Carried as a separate unit is a flexibly mounted sub-frame, the engine has a light flywheel and supports neither the clutch nor the starter motors. Instead the clutch—an 18-in (45·7-cm) two-plate assembly complete with starter ring—is enclosed within a bell housing bolted to the front of the main gearbox casing which also carries two 24-V C.A.V. axial starter motors. Between engine and clutch the drive is taken by a very short shaft on the flanged ends of which narrow external teeth are machined. These teeth engage with internal teeth on the crankshaft and clutch shaft and allow for any movement of the engine in relation to the clutch and so dispense with the need for a universal coupling.

Both the main and auxiliary gearboxes, which are closely coupled, are of the constant-mesh type, each controlled by a separate lever, the auxiliary unit providing an overdrive of 0·735 to 1, direct drive, and a reduction of 1·728 to 1. The main gearbox ratios are: first, 6·0; second, 3·14; third, 1·68; fourth, direct; and reverse, 6·15 to 1.

Between the auxiliary gearbox and the foremost driving axle the transmission is by a 2-piece propeller shaft, the sections of which are interchangeable and which is supported midway on a wide steady-bearing. The double-reduction driving axles are of a most unusual design, which has been developed in conjunction with Kirkstall. Primary reduction is by overhead worm gearing and the secondary by an epicyclic train which also combines the duties of a differential, the overall reduction being 14·4 to 1. At the request of the Iraq Petroleum Co. a third differential has been interposed between the two axles.

Full air-pressure braking is applied to all wheels and there are two air-line connections for actuating the brakes on the semi-trailer wheels through the same system. A 15-ft³ (0·42-m³) compressor feeds three pressure reservoirs and the system is also employed to assist the operation of both the clutch and the hand brake and can be tapped for inflating tyres. Power assistance to the cam and roller steering gear is provided hydraulically by a system developed by Thornycrofts and produced by Clayton Dewandre which incorporates an engine-driven pump. The normal-type steering is assisted by hydraulic cylinders coupled to a second drop arm on the opposite side of the chassis, which in turn is coupled to the steering linkage through a second drag rod. Thus, should there be any failure of the hydraulic system, direct mechanical control of the steering remains unaffected.

In general, suspension follows usual Thornycroft practice, single inverted semi-elliptic springs at the rear 5 ft 2 in (1·57 m) long and 5 in (12·7 cm) wide, allowing considerable relative rise and fall of the driving wheels when traversing uneven ground. Rubber buffers above and steel slings below, limit maximum axle deflections. At the front the springs are 4 ft (1·21 m) long and 4 in (10·1 cm) wide and in all cases large chromium-plated shackle pins are fitted.

Pressed from ¾-in (1·59-cm) steel, the main frame channels have a depth of 11¼ in (29 cm) and 3¼-in (6·35-cm) flanges and are joined by cross-members of similar material, diagonal bracing being introduced to reinforce the structure between the driving axles and to support the propeller shafts' intermediate bearing. Rubber-bushed arms relieve the rear springs of driving and braking torque reactions.

The driver occupies a normal behind-engine position and a light all-metal cab designed to meet tropical conditions has been designed by Comjoints, Ltd. Two 100-gal (45·4) fuel tanks are mounted transversely behind the cab and within the framework of a substantial bolster structure.

The Crane semi-trailer has a massive cranked frame on which a steel floor 2 ft 7 in (78·7 cm) from the ground is welded. At the front end the frame is cranked to rest on a turntable attached to a sub-frame on the tractor. From the base of this front cranked section the load-carrying portion of the trailer can be detached and then lowered on two 20-ton (20,320-kg) in-built hydraulic jacks to facilitate end loading of the trailer. The front turntable of the trailer is supported on screw-operated jacks on the tractor rear end.

For carrying pipes which are 93 ft (28·3 m) long and have a diameter of 30 in (76 cm), each weighing 6½ tons (6,858 kg) a cradle in which the ends of four pipes can rest is mounted on a turntable on the rear end of the tractor, the rear ends of the pipes being supported in a corresponding cradle on rectangular trailer framework having a similar 8-wheeled bogie to that of the semi-trailer. Three more pipes are then laid over the four already in position, the load thus forming the backbone between the tractor and the trailer, a steel safety cable connecting the two. Flexible piping for the air-operation of the trailer brakes is also provided.

When not in use the trailer portion can either be coupled to the rear of the tractor by a drawbar or lifted on to the tractor in cases where lifting tackle is available.

THORNYCROFT'S MIGHTY ANTAR TRACTOR SHOWN HAULING THE LOW-LOADING MACHINERY TRAILER OF 50-TONS CAPACITY

Printed in England for "British Engineering", Dorset House, Stamford Street, London, S.E.1 at The Hayward Press, London, S.W.8 [R.P.9060/6540]

● During the early 'fifties, the Antar was hardly out of the trade press, with its every move covered in '*Commercial Motor*', '*Motor Transport*' and other journals. This is an article from '*British Engineering*' of May 1950, which has been reprinted for Thornycroft (TCV.1304) as a sales tool.

● In 1953, Thornycroft supplied two short-wheelbase, ballast-box versions of the Antar to Australia, for use on the Snowy Mountains hydroelectric project. The tractors are seen here during testing in the UK, coupled to a Cranes hydraulically-suspended drawbar trailer carrying a 100-ton (101 tonne) stator, under the watchful eye of Robert Wynn and Sons. Note the enormous size of the Antar train compared to the typical eight-wheeled truck of the period.

DEVELOPMENT

Sons, carrying a 100-ton (101 tonne) stator from GEC at Witton, Birmingham, to Uskmouth power station in North Wales. The Snowy Mountains teams rode in the cab and were expected to share the driving duties, although anecdotal evidence suggests that they were very nervous of the narrow British roads.

The original Mk 1 was replaced by the much-improved Mk 2 in 1955, which was based on the Snowy Mountains tractors, and then by the Mk 3 in 1959. Both were constructed in fifth-wheel configuration for use with semi-trailers, and as ballast tractors for use with a drawbar trailer.

Production

All of the Antars were constructed at Thornycroft's Basingstoke factory, situated on a 63-acre site at Worting Road, where the company had been established since 1898. The Meteorite engines were built at Rover's Ministry of Supply factory at Acocks Green, where the Meteor engine was also built.

Antars remained in the company's catalogue until 1965 but, by this time, Thornycroft had been taken over by AEC's parent Associated Commercial Vehicles (ACV) – in 1961 – followed by a merger with Leyland the following year. The total number of Antars, constructed, of all marks, was in excess of 700 with production finally coming to an end in 1964.

The Basingstoke factory closed in 1969, and all truck production moved to Scammell at Watford, where it could be argued that the subsequent Commander was effectively an Antar Mk 4. The Basingstoke site was sold in 1973 to the Eaton Corporation of Ohio. ■

FACTS & FIGURE - THE IPC ANTARS

Engine: Rover Meteorite Mk 101, diesel		
Cylinders	60° V8	60° V8
Capacity	18,019cc	1099in³
Bore and stroke	5.4 x 6in	137.1 x 152.4mm
Fuel	diesel oil	
Power output at 2000rpm	250bhp	186.4kW
Maximum torque at 1250rpm	728 lbf/ft	987Nm

Dimensions and weight		
Overall length	382in	9702mm
Overall width	123in	3124mm
Height to top of cab	120in	3050mm
Wheelbase	252in	6401mm
Bogie centres	62in	1575mm
Ground clearance		
front axle	16.5in	419mm
rear axle	15.5in	394mm
belly	21in	533mm
Turning circle (solo tractor)	85ft	25.9m
Weight		
unladen	15.5 ton	15.78 tonne
maximum permissible axle laden weight		
front	9 ton	9.16 tonne
rear	36 ton	36.65 tonne
maximum gross train weight	100 ton	102 tonne

Performance		
Fuel consumption	3-3.5mpg	1.06-1.24km/litre
Maximum speed		
overdrive (top)	28mph	45.5km/h
direct	20.5mph	33.2km/h
Maximum grade (solo tractor)	40%	1 in 2.5

THE FIRST MILITARY ANTARS

The Army's bacon is saved by the Antar Mk 1 (FV12001)

At the beginning of WW2, the standard British heavy tank transporter – what these days we would describe as a heavy equipment transporter (HET) – was the Scammell Pioneer TRMU/TRCU, initially rated at 20 tons, but later upgraded to 30 tons. The design dated from the late 'twenties and, lacking front-wheel brakes and almost any attempt at creature comforts, was almost certainly obsolete soon after it entered service in 1937 It was superseded by the Diamond T Model 980/981 in 1941... a fine piece of work that was ultimately rated for 40 tons. However, tanks had become inexorably weightier as the war ground on and by 1945, the Centurion, which was intended to be the standard British main battle tank of the post-war years, weighed in at 45 tons (45.8 tonne). The Conqueror, which could trace its origins back to 1944 but which finally entered service in 1955, weighed a massive 65 tons (66.2 tonne).

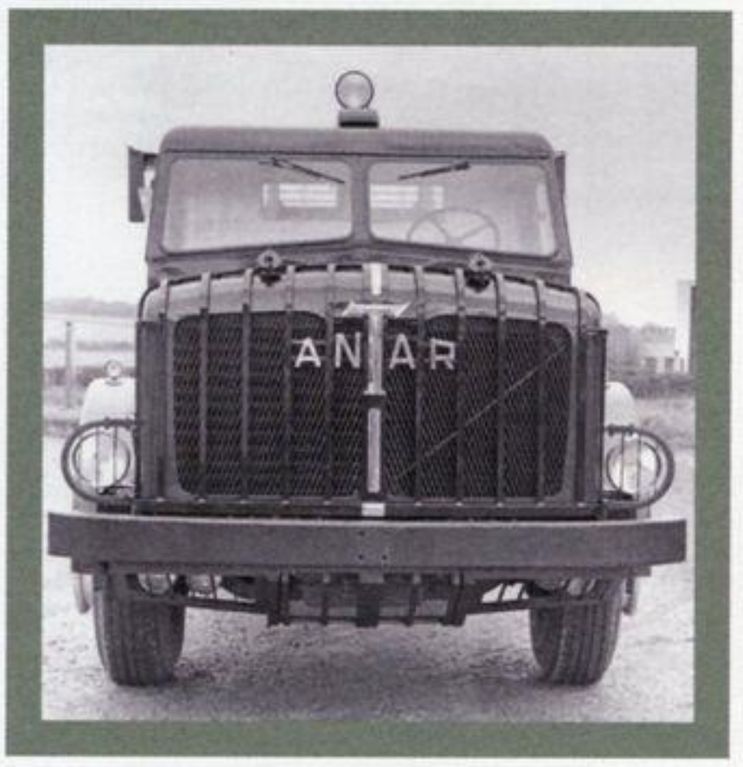
Two new tank transporter/recovery vehicles were being developed to handle the weight of these tanks... the FV1200 which was designed to be used with the 50/60-ton tank transporter trailer, and the FV1000, with the ability to handle up to 100 tons gross train weight.

As is the way of such projects, especially during those cash-strapped post-war years, progress was at best halting. At the same time, the requirement was urgent... the Conqueror tank was in development, Centurions had appeared at the very end of WW2, and, although suitable trailers had been ordered, there was no tractor available to transport either tank from base to battlefield. True, the Diamond T was able to gain a useful life extension when its original Hercules engine was replaced by a Rolls-Royce C6, with work beginning in the early 'fifties, but it was never going to cope with the weight of the mighty Conqueror and its days were clearly numbered.

With progress all but stalled on the FV1000 and FV1200 projects, the Army must have been in something of a panic... with the appearance of the Antar coming just in time to save the day.

In August 1949, at a meeting convened to discuss the development of Britain's post-war military vehicles, the Director of Fighting Vehicle Production

● Antar Mk 1 (FV12001) from contract 6/Veh/5302, dated 1951. The contract called for 15 tractors, for the War Office, for which the official nomenclature was 'Tractor, 30 ton, GS, permanent body, 6x4, Thornycroft Antar' The steel ballast body was not removable.



● The frontal aspect demonstrates the sheer size of the vehicle, while the twin radiators emphasise the width. Note the slinger rings fitted to the wheels to allow the vehicle to be hoisted by crane onto the deck of a ship.

ANTAR MK 1

● When the FV1000 project was dropped in March 1955, the single prototype was converted for gradient-simulation duties at FVRDE. By this time, the Antar had proved itself to be more than capable of moving even the Conqueror tank, and the FV1000 prototpye was eventually scrapped in the mid-seventies.

drew the attention of delegates to the Thornycroft Mighty Antar – although, interestingly, the military never called it the Mighty Antar, always dropping the adjective – and in particular, to the claim that it could handle an 82-ton (83.5 tonne) load. It was agreed that the availability of the Antar be investigated during 1951/52 with a view to considering it as an alternative prime mover. The lack of front-wheel drive meant that it could not be considered as a direct replacement for the FV1000/FV1200s but it would get the army out of a hole!

● Powered by a fuel-injected Meteorite engine, FV1000 was a massive 60-ton tractor intended to be used for moving the 65-ton Conqueror tank. Work started in 1949, with a full-size mock-up constructed at Leyland's factory. The prototype vehicle finally appeared in 1951, complete with a special matching semi-trailer, designated FV3301.

● Forming part of a projected 30-ton FV1200 series, FV1201 was described as an artillery tractor... the series also included fifth-wheel tractors for moving tanks both on and off the road (FV1206, FV1207). Like the FV1000, the vehicle was powered by a fuel-injected Meteorite engine.

● Twin giants, although FV1200 actually manages to make the Antar look quite modest!

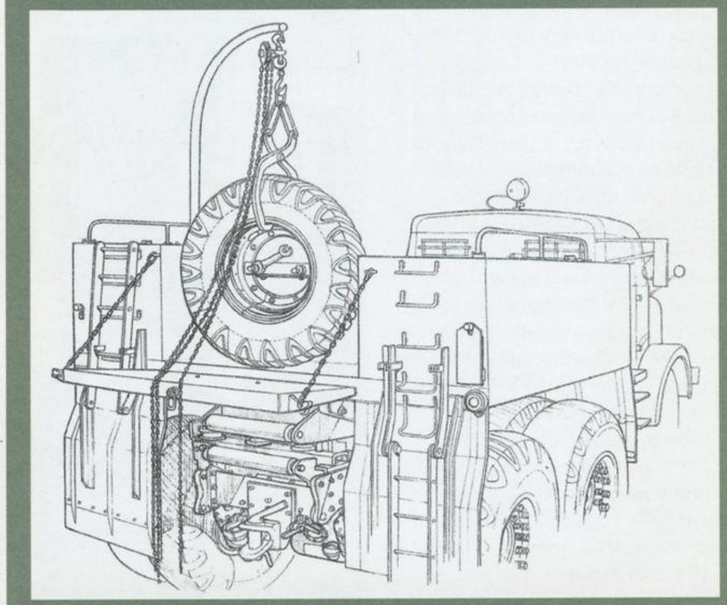
ANTAR MK 1

● Two FV1200 prototypes were eventually constructed by Leyland. Although the first example went to Germany for trials and was also demonstrated at the FVRDE Exhibition in 1956, both ultimately ended up as scrap at Hardwick's yard in Ewell, where they remained until the late 'eighties.

There were none of the usual trials. It seems that the Army had seen the Antar in action at Bagshot Heath in 1950 and, had doubtless had sight of Rover's report into the running of the Meteorite engine in Iraq. With little or no further formality, the Ministry of Supply went ahead and placed the first contract for Antars in 1951.

The first contract for Antars covered 15 vehicles, in what the Army described as Mk 1 configuration, designating the vehicle FV12001. The price of each tractor was £8177 – more than

● Line-up of seven, out of a total of eight, Antar Mk 1 tractors intended for the RAF and supplied under contract 6/Veh/5718. Obviously the photograph was taken at Thornycroft's works.



● A crane was provided for handling the spare wheel. When erected in the ballast box, it allowed the wheel and tyre assembly, which weighed 5 cwt (255kg), to be lifted free of its mounting at the rear of the body, and lowered to the ground.

simulator at the FVRDE at Chertsey before being sold for scrap in the mid-seventies. Although two prototypes were constructed of the FV1200, this project too was eventually cancelled, although it did struggle on until 1960. Both of the prototypes ended up as scrap in Hardwick's yard in Ewell. Interestingly, the last Diamond Ts were not demobbed until the mid-seventies but, by this time, they were reserved for tank movements in Britain.

Description

The Ministry of Supply described the Antar as being 'basically a commercial tractor that has been modified for military purposes' In most respects, this was true, but there were three major modifications when comparing military Antars to the original Iraq Petroleum vehicles.

Firstly, the overall length of the vehicle was reduced by 50 inches (1263mm), from 382in to 332in

£254,000 in today's money. Work on the first vehicle started in March 1951 with delivery in late June, when it was submitted for trials at FVRDE, and there was a subsequent contract from the Air Ministry for eight trucks.

By 1952, the last of the Mk 1s had been delivered and all subsequent deliveries were of the Mk 2 or Mk 3 specification, and, although both the FV1000 and FV1200 projects had yet to be abandoned, Thornycroft were boasting that 'no other tractor is under consideration for the same purpose'

The FV1000 project was finally abandoned in 1955, due to problems of weight, cost and mobility. No more than one vehicle was constructed, ending its days, much modified, as a gradient

● 02BD16 was the second vehicle of an initial batch of 15 Antars Mk 1 (FV12001) intended for the Army, and supplied under the first contract dated 1951. The winch, which was installed between the cab and the ballast box can be clearly seen; note the lack of trafficators, which were normally fitted to the rear corner of the cab.

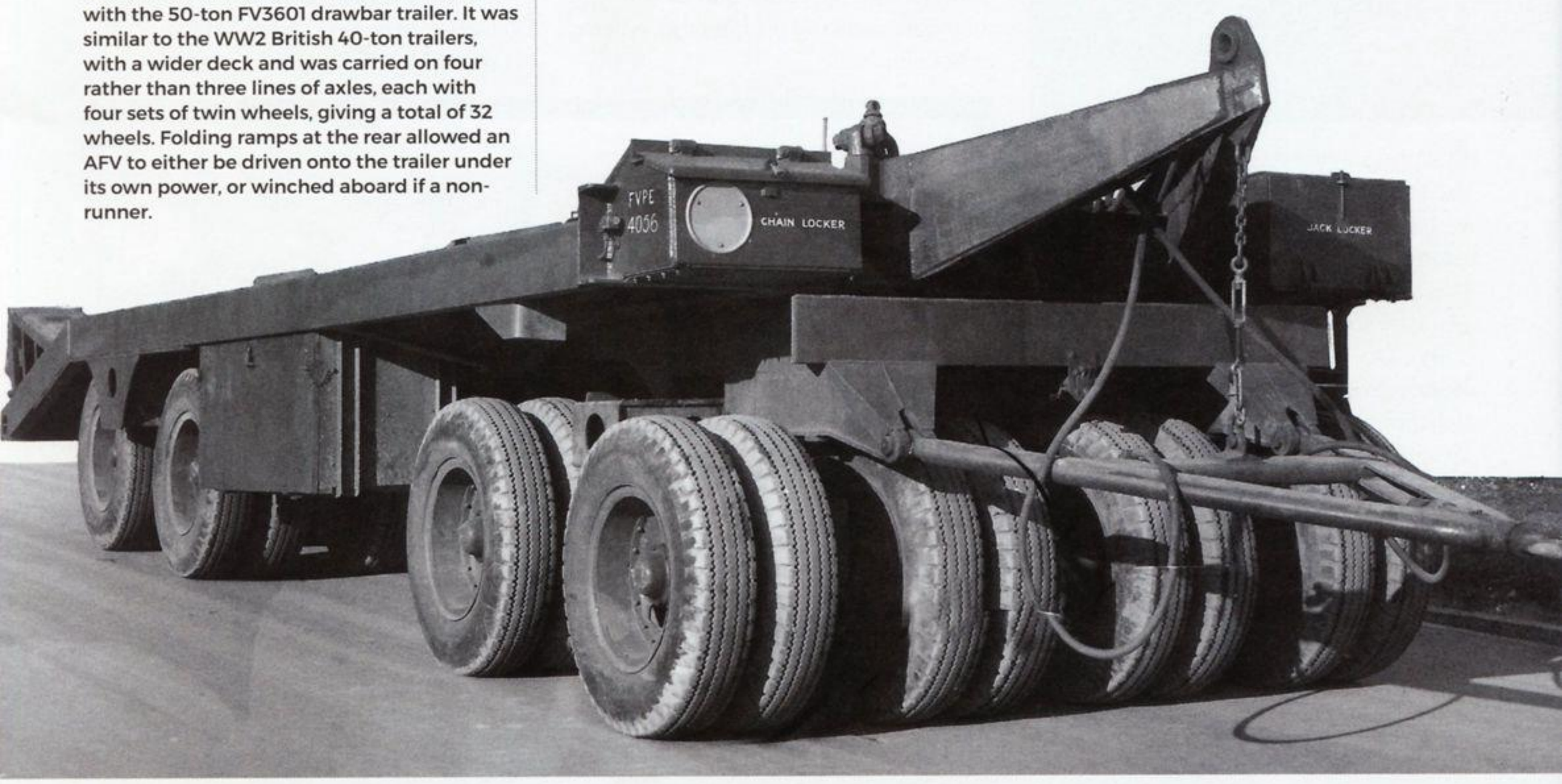
(9703mm to 8440mm), giving a wheelbase of 186in (4720mm) rather than 252in (6400mm).

Secondly, where the Iraq Petroleum tractors had been designed for use with a fifth-wheel trailer, the military Mk 1 was fitted with an open-topped steel ballast box to allow its use with a drawbar trailer. The average ballasted load was 33,000 lb (15 tonne), but a maximum of 60,000 lb (27.27 tonne) was authorised. An engine-driven Darlington winch, rated at 20 tons, was installed behind the cab to assist with loading and unloading disabled tanks; the winch could not be used for self-recovery.

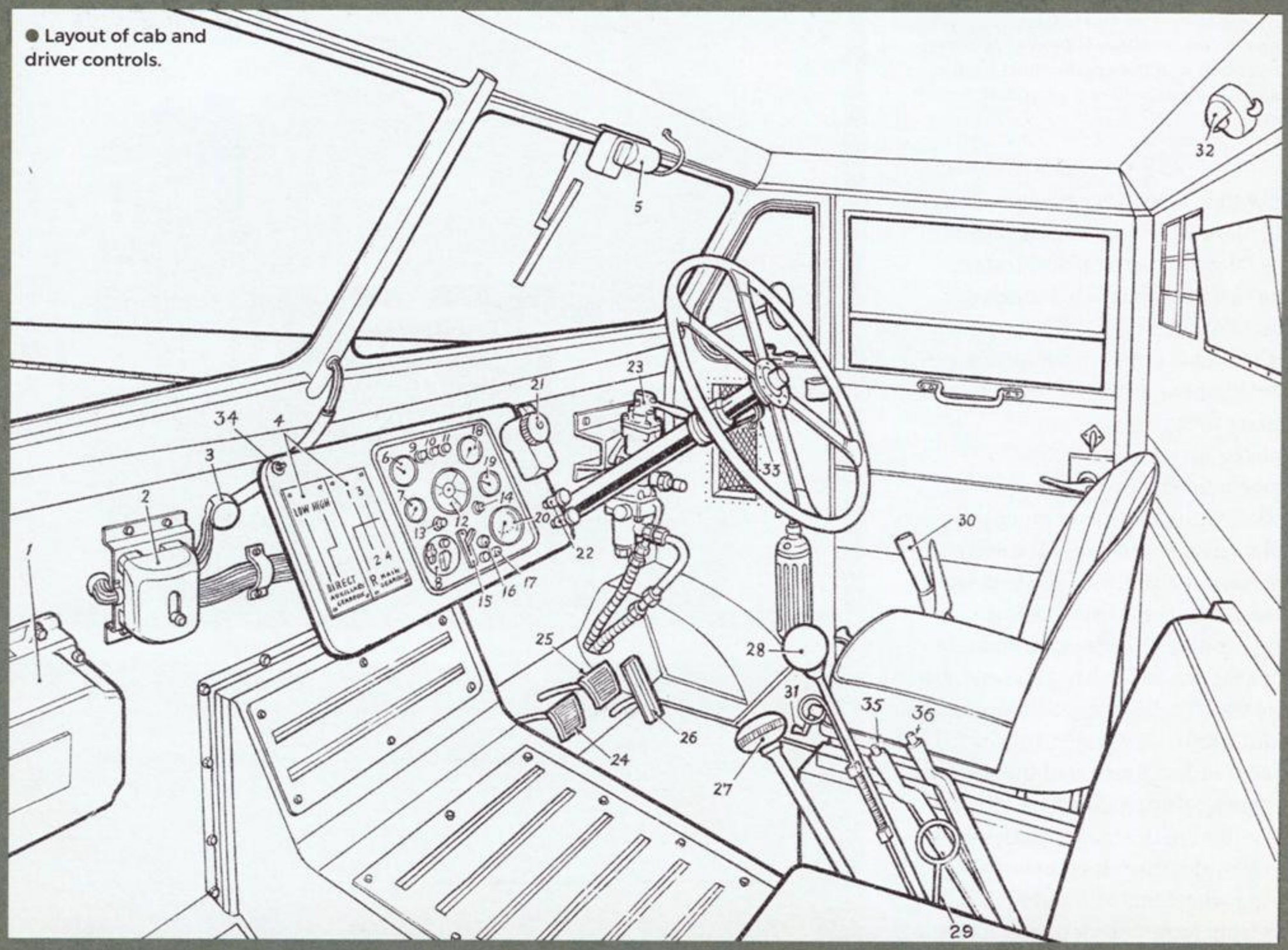
And lastly, the Meteorite engine in diesel form was considered to develop insufficient power for tank-transporter duties and was replaced by a twin-carburettor version, designated Mk 204. Designed to run on standard military 68/70-octane fuel, the engine was fitted with a pair of huge Solex 46ZNHP carburettors, and sparks were provided by two BTH magnetos, with two spark plugs installed per cylinder. Power output was 260bhp at 2000rpm, an increase of just 4% over the original, with a maximum torque figure of 800 lbf/ft (1085Nm). However, the price of all this petroleum-induced power was high, with fuel consumption, when fully loaded, measuring around one mile per gallon (0.35km/litre).

● View of the interior of the cab, showing the driving position and the layout of the controls. The driver's seat was adjustable, but the two passengers had to make do with a simple bench seat on top of a storage box.

● The Mk 1 Antar was intended to be used with the 50-ton FV3601 drawbar trailer. It was similar to the WW2 British 40-ton trailers, with a wider deck and was carried on four rather than three lines of axles, each with four sets of twin wheels, giving a total of 32 wheels. Folding ramps at the rear allowed an AFV to either be driven onto the trailer under its own power, or winched aboard if a non-runner.



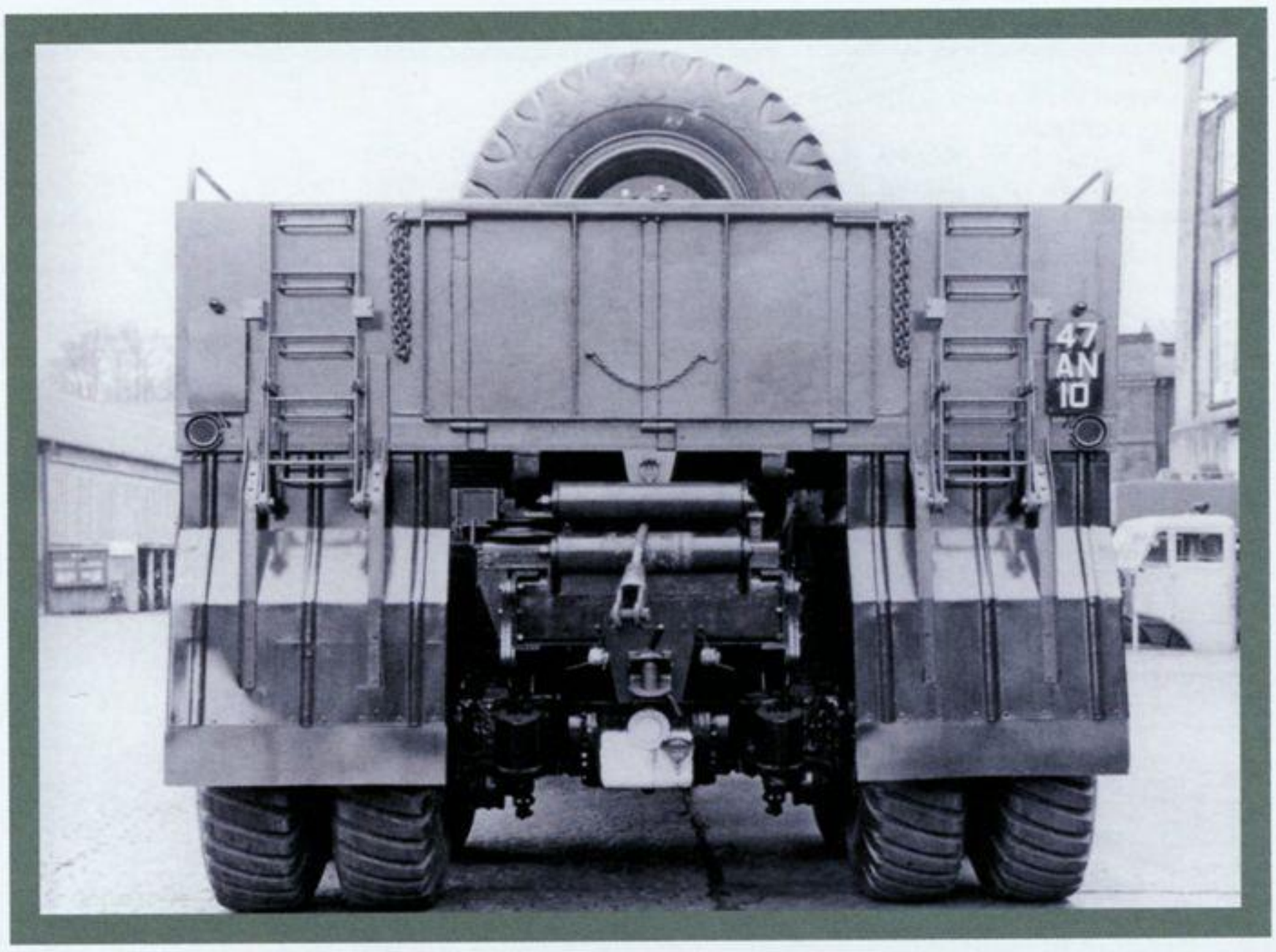
● Layout of cab and driver controls.



1	Control board	13	Left magneto test switch	25	Brake pedal
2	Fuse box	14	Right magneto test switch	26	Accelerator pedal
3	Junction box	15	Ignition switch	27	Auxiliary gearbox change-speed lever
4	Gearshift indicator plate	16	Starter button	28	Main gearbox change-speed lever
5	Windscreen wiper switch	17	Inspection lamp sockets	29	Power take-off control
6	Oil-pressure gauge	18	Air-pressure gauge	30	Handbrake
7	Water temperature gauge	19	Ammeter	31	Seat adjustment
8	Lights and master switch	20	Speedometer	32	Cab lamp rheostat
9	Searchlight switch	21	Trafficator switch	33	Combined horn and dip switch
10	Fog lamp switch	22	Rich mixture control	34	Cab fan switch
11	Panel lamp switch	23	Trailer brake control	35	Winch brake
12	Tachometer	24	Clutch pedal	36	Winch clutch

The transmission arrangements remained as before, with a power-operated Borg and Beck twin dry-plate clutch, interposed between the engine and a remotely-installed constant-mesh four-speed main gearbox, which lacked synchromesh. A mechanical clutch-brake system was employed to aid upward changes, and the transmission was also fitted with a cooling fan. The auxiliary gearbox had three ratios, designated 'low' (1.728:1), 'direct' (1:1), and 'high' (0.732:1). It was apparently

● Mk 1 Antars photographed in the erecting shop. Clearly, the size of the vehicle means that it is not possible to construct it without climbing on, or over, every flat surface... so, presumably the final coat of paint was not applied until all of the construction tasks had been completed.



● Rear view of an RAF Mk 1 showing the drop-down tailgate to the ballast body, with folding ladders on either side to ease access into the body, and the spare-wheel position. The winch fairlead rollers are beneath the tailgate.

not possible to skip gears when driving the beast, and missing a gear meant that it was necessary to stop and restart!

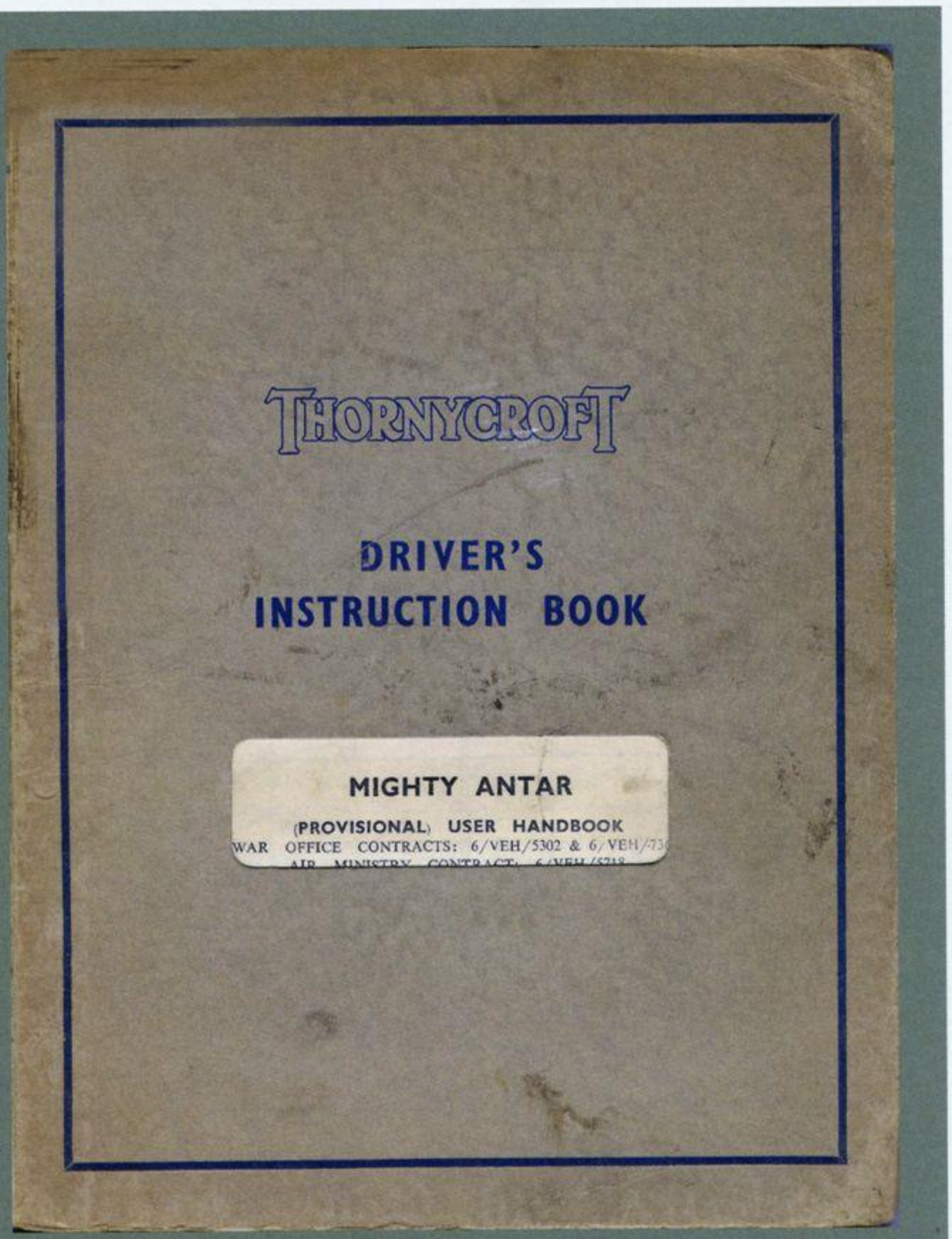
The main gearbox also included power take-off facilities for the winch and the braking system compressor, which, incidentally, could also be used to inflate the tyres.

The braking and steering arrangements followed previous practice, with power assistance provided by air-pressure and hydraulic systems, respectively. Airline connections were provided front and rear to allow tandem operation under single control, and to permit the trailer brakes to be operated by the tractor. A hand-reaction valve in the cab allowed the trailer brakes to be operated independently of the tractor, for example during down-hill descents.

The steering box was a Marles cam-and-roller design, with a massive steering wheel that still required 5.75 turns from lock-to-lock to give a turning circle of around 68 feet (20.7m). The hydraulic assistance on the steering system was not very effective, and, to quote the War Office 'B Vehicles data summary book', 'the power assistance only works efficiently at engine revs over 1200rpm'... which, of course, is when it is least needed!

Live axles were fitted at front and rear, and the suspension consisted of multi-leaf semi-elliptical heavy-duty springs, inverted at the rear and pivoted on bolted spring boxes. Thornycroft claimed that the use of a lighter, undriven, front axle ensured that, when coupled to a loaded trailer, the maximum weight was placed over the rear wheels where traction was required. Wheels were shod with earth-mover tyres, for example Goodyear 'Hard Rock Grip' or Dunlop 'Power Grip'

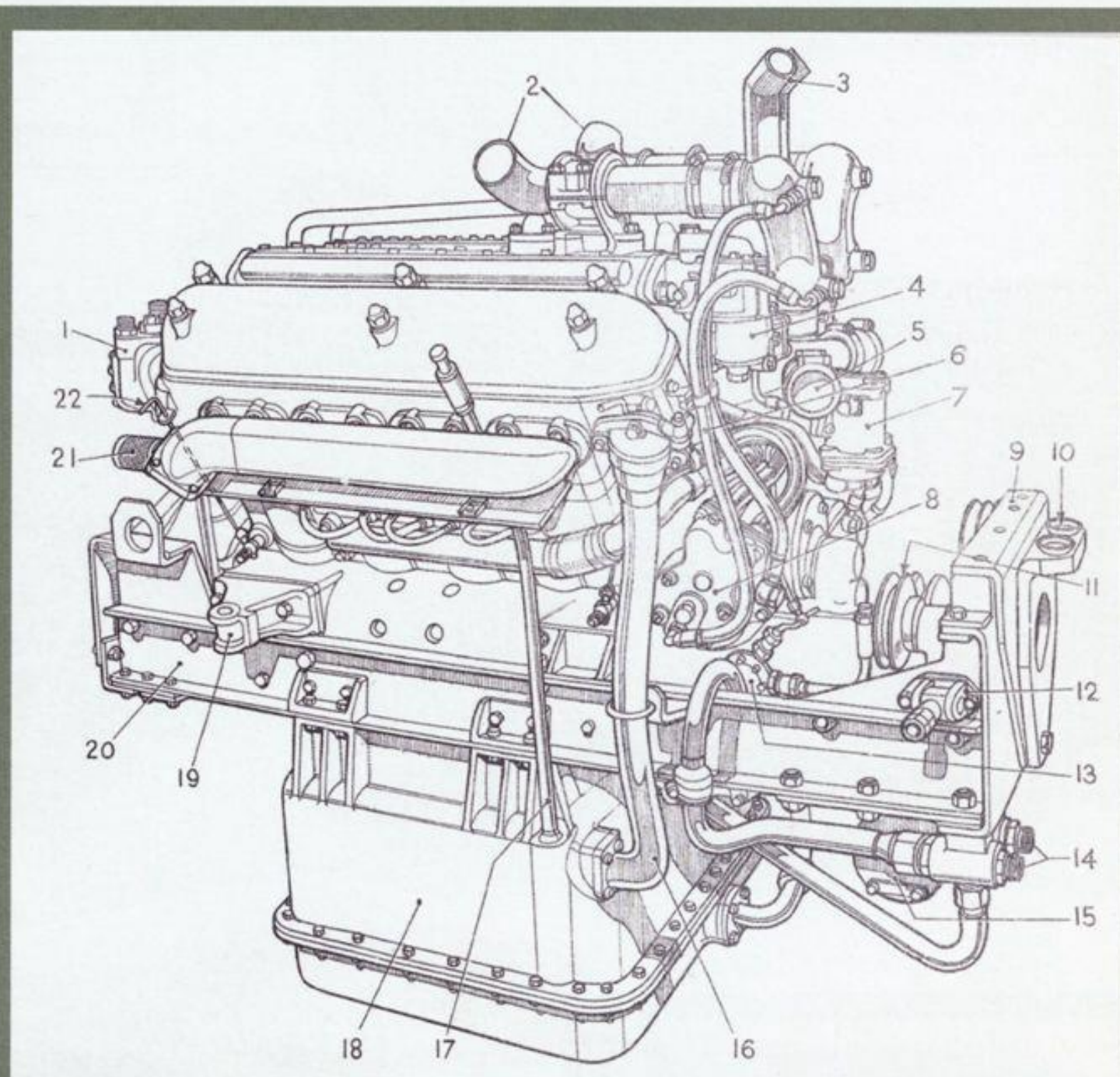
The cab was very similar to the original Comjoints design but was produced by Bonallack & Sons, or by Thornycroft using panels supplied by Motor Panels Limited. Changes included the use of a covered hatch over the passenger seat to allow the use of an anti-aircraft machine gun, and the



● Provisional user handbook. Based on material produced by Thornycroft for commercial customers, and described as Air Publication 4357A, the title page announces that 'this book will be replaced by Joint Service Use Handbook'... two editions were ultimately produced.

● Meteorite Mk 204 engine; drawing taken from an official War Office publication.

1 Hydraulic steering pump
2 Air inlet pipes
3 Water outlet pipes
4 Right-hand carburettor
5 Right-hand water inlet pipes
6 Magneto breather pipes
7 Booster coil
8 Magneto
9 Mounting face for fans
10 Front engine supports
11 Right-hand fan jockey pulley
12 Right-hand fan-belt adjuster
13 Right-hand fuel pump
14 Connections to oil cooler
15 Main oil filter
16 Oil filler pipe
17 Dipstick tube
18 Oil tank
19 Right-hand torque reaction support
20 Engine subframe
21 Oil tank breather filter
22 Right-hand cylinder drain cock

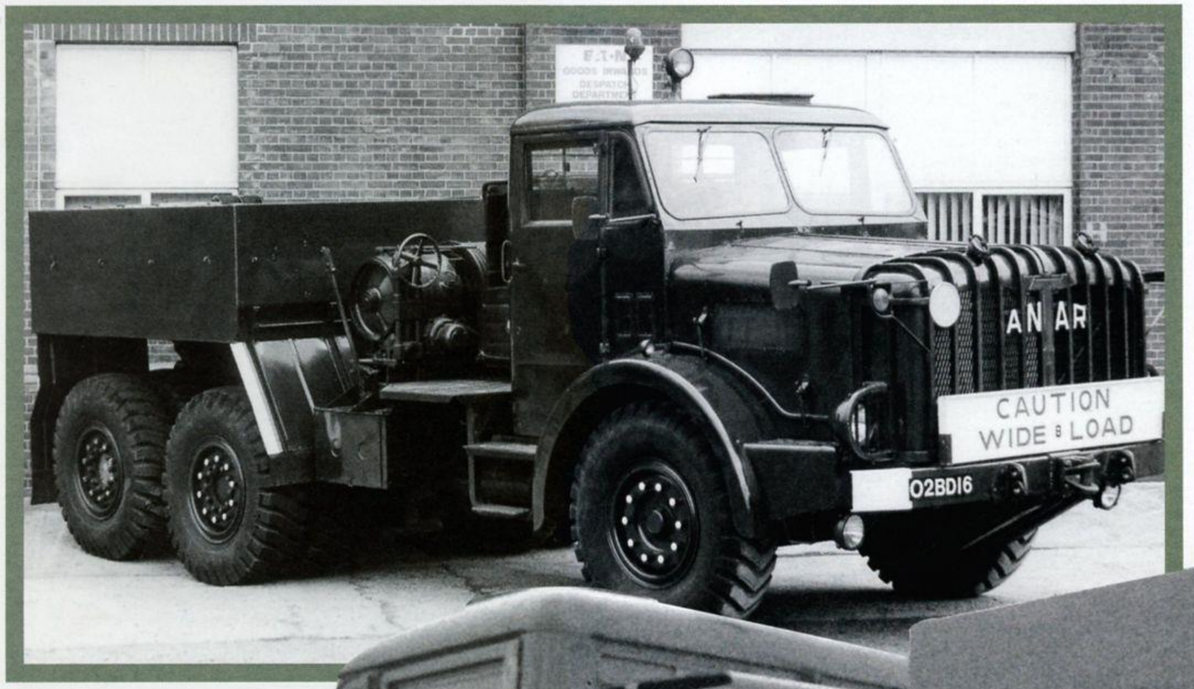


lower edge of the windscreen now followed a shallower angle than that on the original Iraq Petroleum vehicles. The engine compartment vents were mesh-covered rectangular panels rather than the simple slots that had been provided on the original IPC tractors. Wide steps and handgrips were provided to ease access, and there was seating for three: the driver on an adjustable green-finished canvas-covered bucket seat, with space for two passengers on a fixed bench, which also provided accommodation for the batteries.

Trailers

The military Antar was intended for use with the 50-ton drawbar trailer designated FV3601, which had been introduced to 'lift' the Centurion main battle tank, and which could also be found coupled to the Diamond T Manufactured by Dysons and Cranes of Dereham, in three marks, it was not unlike the British 40-ton trailers of the WW2 period, albeit with a wider deck, and carrying four rather than three lines of axles. Each axle line was four sets of twin wheels, giving a total of 32 wheels.

● Front three-quarter view showing the position of the twin fuel tanks, stacked one above the other behind the cab. Note the large semaphore indicators fitted onto long brackets on the rear corner of the cab, and those tiny rear-view mirrors must have made rear vision very difficult.



Folding ramps at the rear allowed an AFV to either be driven onto the trailer under its own power, or winched aboard if it was not able to run. On the Mk 1 trailer the deck was fully covered; on the later Mks 2 and 3 the centre of the deck was open between the trackways.

Four lashing chains and turnbuckles were provided to secure the load.

● 02BD16 photographed from the front and from the rear. Bearing in mind its size, the vehicle actually appears rather compact. This tractor forms part of the historic vehicle collection of the REME Museum. The amber rotating beacon is a later addition, fitted in recognition of the low, low top speed of less than 30mph (48km/h).

Perils of driving

Driving the Antar was definitely not for the faint hearted. Period military reports made much of the skill required to drive the outfit, stating that 'driving this vehicle with young and inexperienced drivers should not be undertaken'... although, in theory, it was permissible for a 17-year old serviceman to drive a vehicle of thiis size and weight, where a civilian driver would have to be 18 years old!

On the road, as one might imagine, the vehicle was necessarily slow but, on the plus side, regular traffic would have tended to keep out of its way whenever possible.

Production

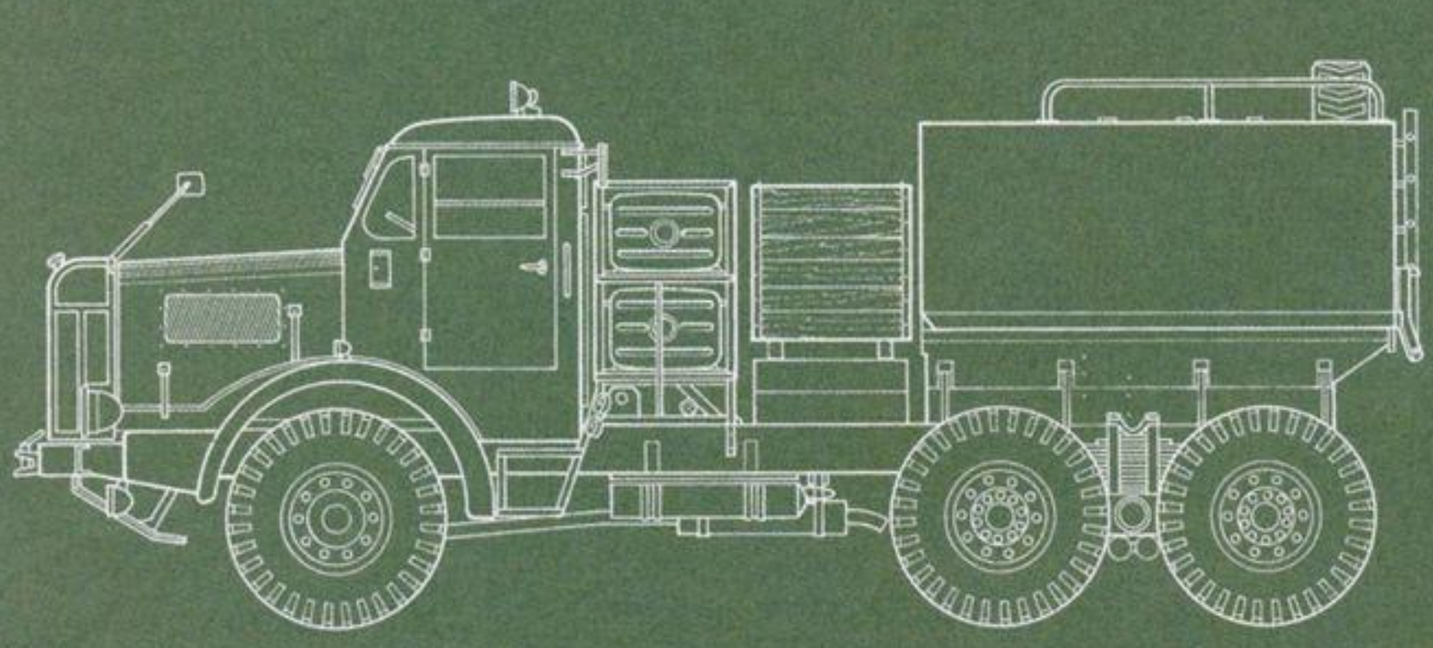
Total production of the Antar Mk 1 was 23 vehicles, with registration numbers 02BD15-20, 12BD74-82, and 47AN03-10 (the latter sequence for the RAF); the last example was delivered in December 1952. It is worth noting that seven of the eight RAF tractors were subsequently passed to the Army, where they were re-registered as 75ZB93-99.

FACTS & FIGURES - MK 1, FV12001 ANTARS

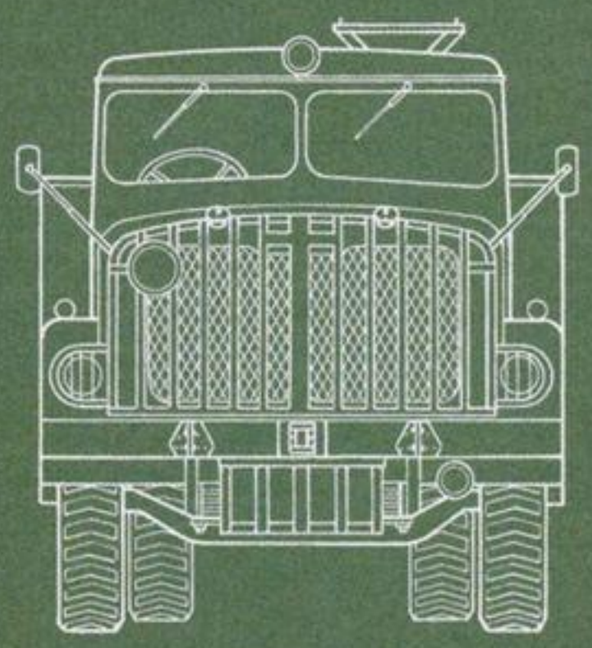
Engine: Rover Meteorite Mk 204, petrol		
Cylinders	60° V8	
Capacity	18,019cc	1099in³
Bore and stroke	5.4 x 6in	137.1 x 152.4mm
Fuel	68-70 octane petrol	
Power output at 2000rpm	250bhp	186.4kW
Maximum torque at 1200rpm	800 lbf/ft	1085Nm

Dimensions and weight		
Overall length	316in	8026mm
Overall width	126in	3200mm
Height to top of cab	120in	3050mm
Wheelbase	186in	4724mm
Bogie centres	62in	1575mm
Ground clearance		
front axle	16.5in	419mm
rear axle	15.5in	394mm
belly	21in	533mm
Turning circle (solo)	68ft	20.74m
Weight		
unladen	19 ton	19.3 tonne
laden with 15 ton (15.27 tonne) ballast	34 ton	34.62 tonne
maximum permissible axle laden weight		
front	7 1 ton	7.23 tonne
rear	11.9 ton	12.16 tonne
maximum gross train weight	100 ton	102 tonne

Performance		
Fuel consumption	1mpg	0.35km/litre
Maximum speed		
overdrive (top)	28mph	45.5km/h
direct	20.5mph	33.2km/h
Maximum grade (solo)	18%	1 in 5.6



● Side elevation, Antar Mk 1, FV12001

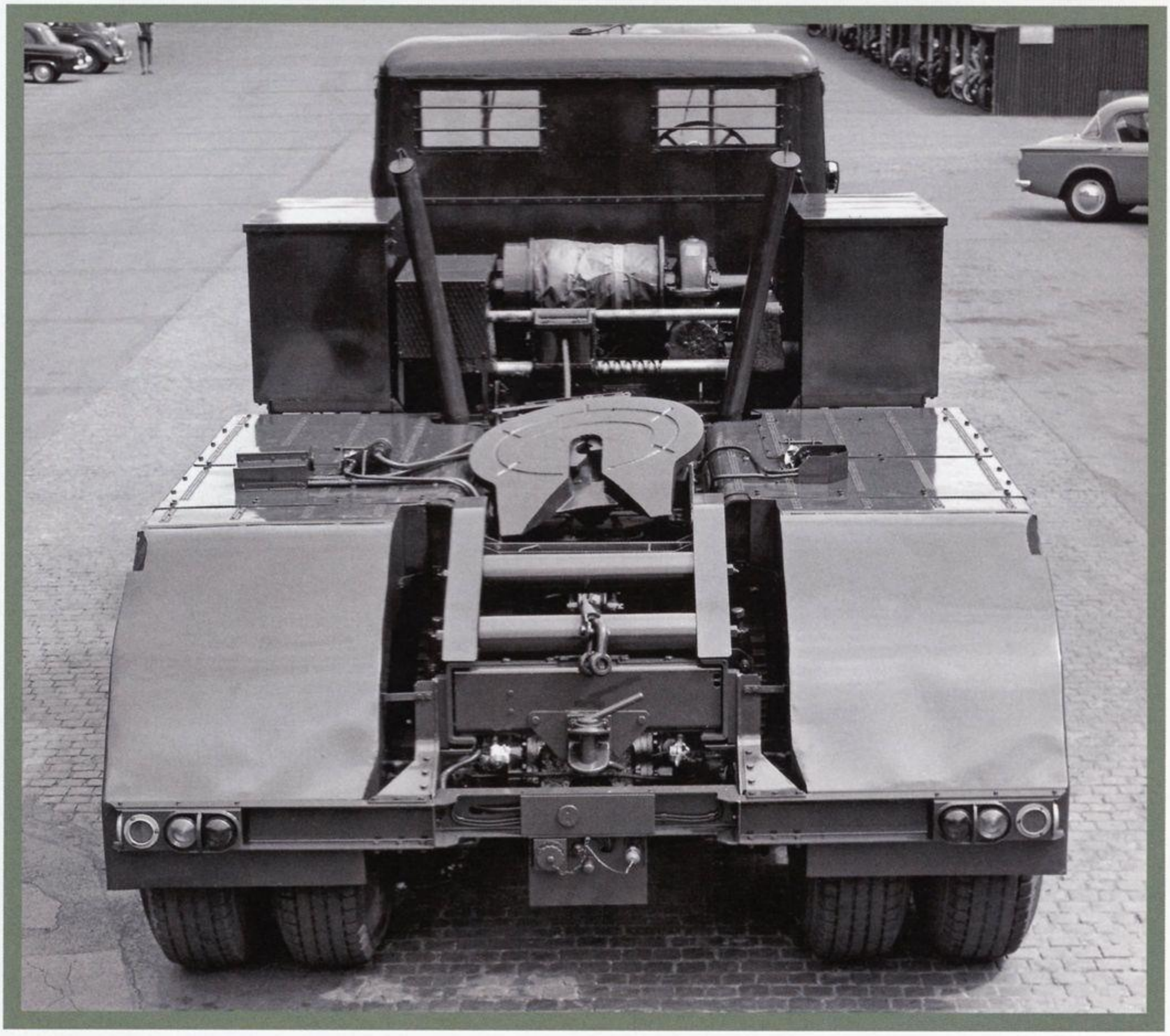


● Front elevation, Antar Mk 1, FV12001

FIFTH WHEELS AND BALLAST BOXES

The Antar Mk 2 (FV12002, FV12003) supersedes the original Mk 1

By the time production ended in 1952, the total number of military Mk 1 tractors that had been produced was just 23 vehicles, but, on 16 April of that year, Thornycroft started work on the first tractor to be designated as Mk 2. It was one of a batch of 13 examples, the first two of which were destined for South Africa. The third example off the line was delivered to the British Army in December 1952, at the same time, apparently, that the last Mk 1 was also delivered. It is a mistake to imagine that the Mk 2 was anything more than a slightly-modified version of the Mk 1... it was certainly not redesigned in any meaningful sense and shared almost all of its engineering features with its predecessor



● High-level rear view of the Antar Mk 2 (FV12002) tractor, showing the fifth wheel, the winch and the twin exhaust pipes.

● 32BP99 was the first of 60 fifth-wheel tractors to be supplied under contract 6/Veh/15775, dated 1954. Aside from the replacement of the ballast box by the fifth wheel, minor changes when compared to the Mk 1, and to early Mk 2s, include the use of flashing indicators, repositioned headlights, and additional rear-view mirrors fitted to the radiator guard.

Designated FV12002, and occasionally referred to in the early days as the 'Mk 1 for semi-trailer', the specification (FVRDE Specification 9173) covering the design, construction and performance of the Mk 2, included the words 'basically similar to the tractor 30 ton 6x4 (in other words, the Mk 1)... but embodying the modifications found necessary during previous proving trials'

Unfortunately, whatever these modifications were, they were not spelled out in detail in the document and, to the casual observer, little had changed. The automotive details, for example, were near-identical. The Meteorite petrol engine in Mk 204 configuration was coupled to the rear axles through a four-speed main gearbox and three-speed auxiliary box. The torque figure was increased to 860 lbf/ft (1166Nm) and there was some confusion about engine power-output figures; various sources contradicted one another, with figures of 250bhp, 260bhp and 285bhp (186, 193 and 212kW) being quoted.

It is interesting that the Army considered the continued use of the Meteorite engine to be no more than a stopgap until a suitable domestically-produced diesel became available... the specification document for the Mk 2 actually included the words 'until a suitable compression ignition engine has been approved for use with this vehicle, propulsion shall be by means of a Meteorite petrol engine'

Similarly, no serious changes seem to have been made to the steering, braking or suspension systems, although some components were redesigned to reduce the possibility of breakage. The main difference between this and the original Mk 1 was simply that there was a fifth wheel fitted for use with a 50- or 60-ton semi-trailer. Supplied by Davies Magnet Limited, the fifth wheel was of conventional design and was placed at a height of 64in (1630mm) above the ground.

● Well-loaded, with what looks for all the world like concrete fence posts, this Mk 2 (FV12003) ballast-box tractor was photographed at Thornycroft's works. Note the anti-aircraft machine-gun mount on the roof, positioned over the passenger seat.

● Antar Mk 2 coupled to the prototype for the FV3001 60-ton 16-wheel semi-trailer. Note the spare wheels, one for the tractor and one for the trailer, carried on the trailer swan neck.

● Batch of four early Mk 2 ballast-bodied Antars photographed passing through Banbury, en-route for the docks at Liverpool.

The cab was of twin-skin insulated construction, and was very largely unchanged when compared to that used for the Mk 1, retaining its flat panels and distinctive perpendicular appearance. There was a 20-ton chain-drive Darlington winch fitted behind the cab, and an anti-aircraft gun mount was still installed above the passenger seat. Changes included mounting the twin fuel tanks in a longitudinal position behind the cab, one either side, covered by protective panels; the storage lockers were now placed on top. The frontal aspect was changed slightly by virtue of fitting four additional headlights below the front bumper to supplement the radiator-mounted lights, and, eventually by omitting these latter lights altogether. The roof-mounted spotlight was moved forward and mounted centrally on the curve of the cab roof. And, of course, the old open-topped steel ballast body was replaced by a fifth wheel.

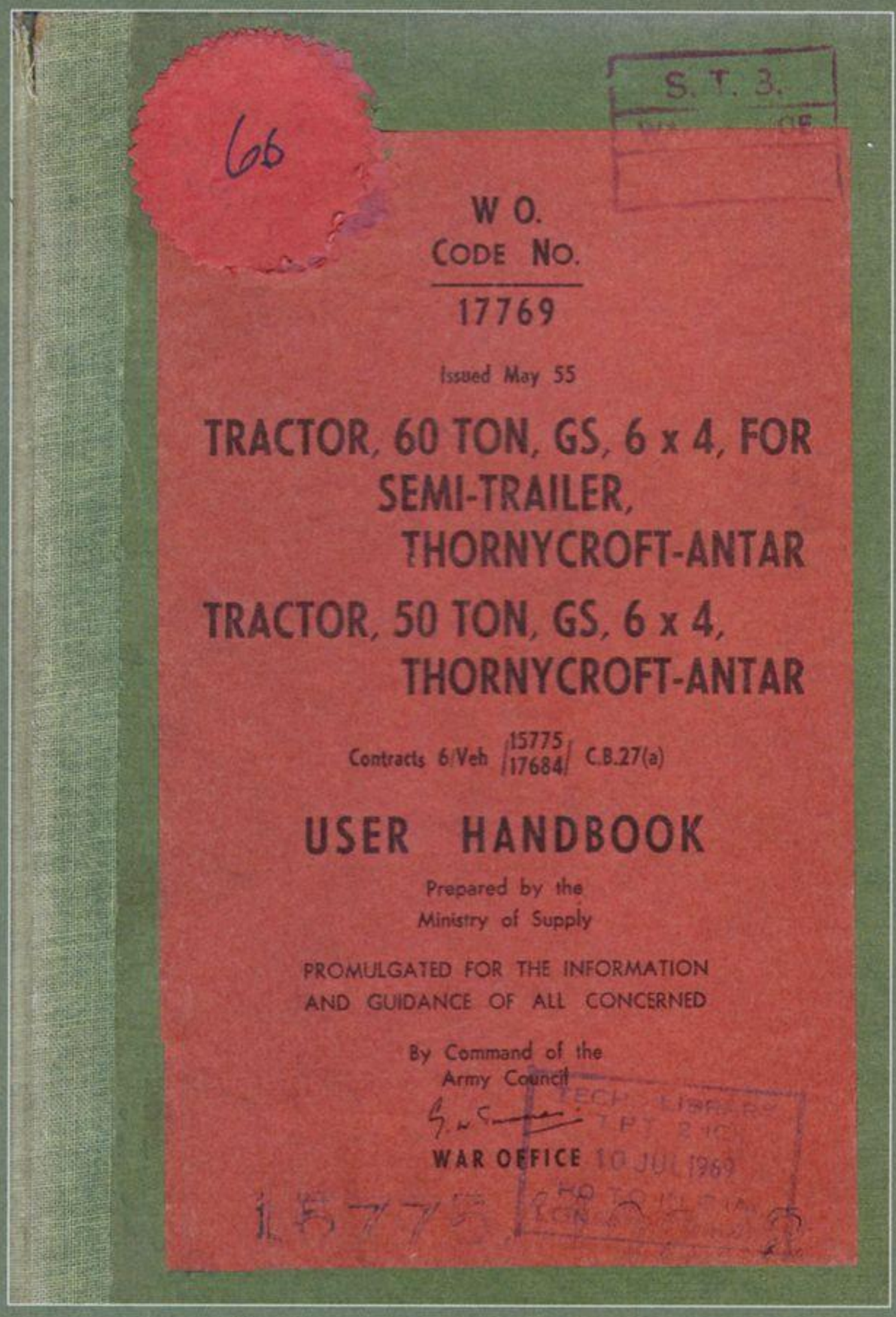
As with the Mk 1, the top speed was a theoretical 28mph (45km/h) but, of course, the road traffic legislation of the time restricted this to just 12mph (19km/h) on British roads.

The fifth-wheel version was quickly followed by a Mk 2 ballast tractor, FV12003, sometimes referred to as the Mk 1B, that allowed the tractor to

ANTAR MK 2

● The rear of the steel-framed timber ballast box had a recess into which the spare wheel could be stowed. A folding ladder was provided on the left-hand side to ease access into the body. In a nice little detailed touch, note how the winch cable is hung on a small chain, presumably to prevent rattling. The vehicle has yet to be given its registration number.

● One of 59 Mk 2 fifth-wheel (FV12002) tractors supplied under contract 6/Veh/21396, 71BR35 is seen coupled to the FV3001 60-ton semi-trailer. The tank in the background is a Chieftain with its turret reversed and pointing to the rear which, of course, is how they were transported.



● WO Code number 17769, User Handbook, dated May 1955, for the Mk 2 Antar in both its configurations. As well as describing the vehicle and its operating characteristics, the handbook included details of the simple day-today maintenance and other tasks that the crew was expected to perform.

be used in conjunction with a drawbar trailer. In a change from the Mk 1, which had a fixed, steel ballast body, FV12003 was fitted with a simple steel-framed timber-panelled body, designed to carry 31,000-60,500 lbs (14,090-27,500kg) of steel ballast in the form of large, cast weights. If required, the body could be easily detached, and replaced, allowing a fifth wheel to be fitted in its place. The ballast tractors also carried a spare wheel, together with a crane and davit system to aid handling, either behind the cab or in the ballast box.

Trailers

The FV12002 tractor was equipped with a fifth wheel for use with the FV3001 60-ton semi-trailer, which was designed to carry the Conqueror and Chieftain main battle tanks, or the later FV3011 50-ton equivalent, which was intended for the Chieftain.

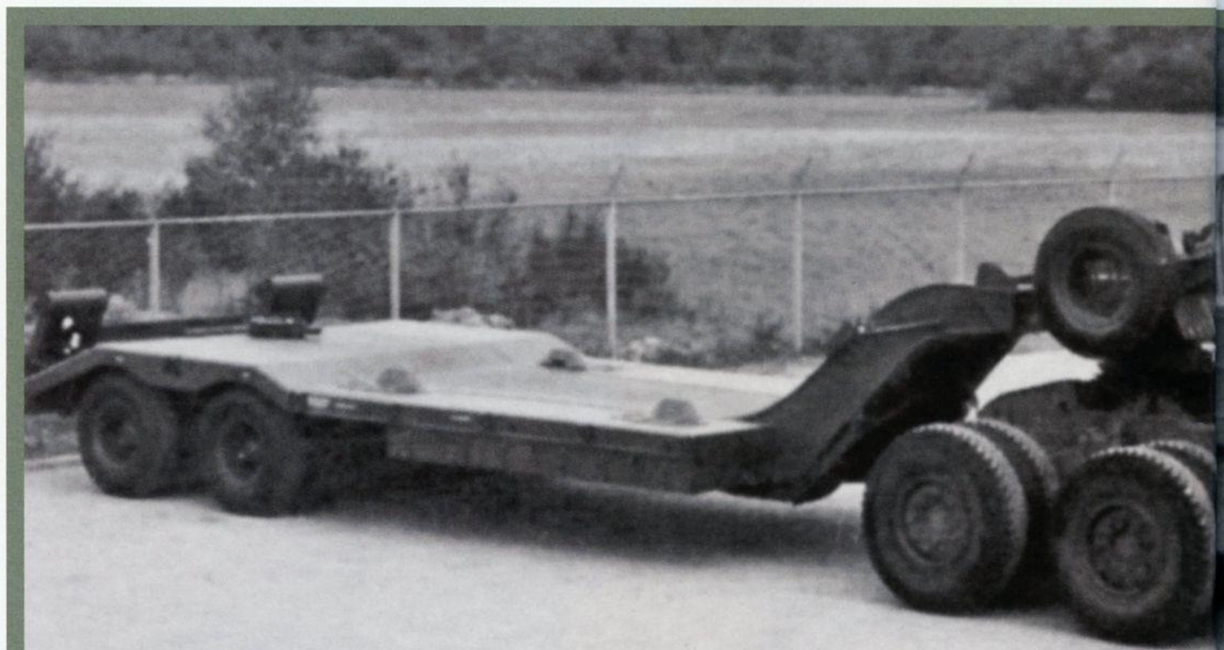
Like the Mk 1 tractor, the FV12003 was generally coupled to the FV3601 50-ton drawbar trailer, which by this time was considered to be something of an antique!

Diesel trials

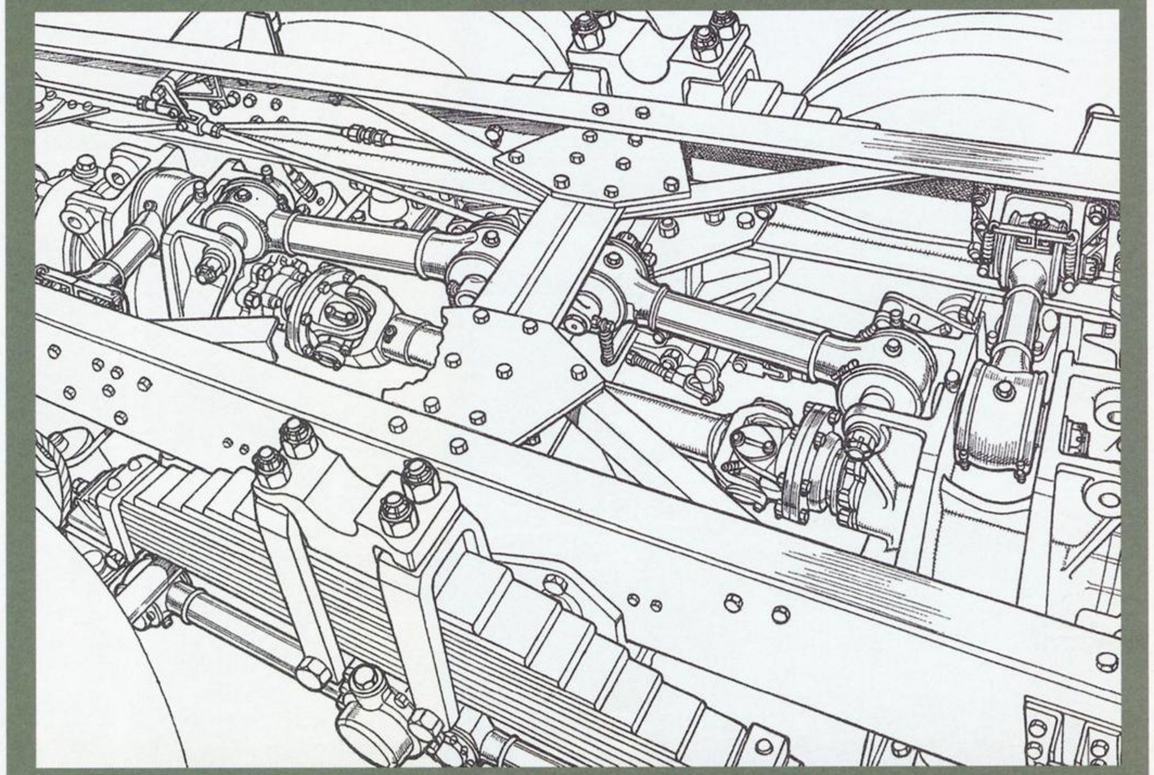
During the spring and summer of 1956, a standard petrol-engined Meteorite-powered Antar was pitched against a pair of development vehicles, one fitted with a Rolls-Royce C6SFL six-cylinder supercharged diesel engine, the

● Early Mk 2 (FV12002) coupled to the FV3001 60-ton semi-trailer. This tractor is still fitted with semaphore indicators. The guide for the winch cable can just be seen at the forward end of the swan neck.

● FV12003 was the Mk 2 equivalent of the original ballast-bodied military Antar. Unlike the Mk 1, the ballast body was of steel-framed timber construction, and could be removed to allow a fifth wheel to be fitted.



● Antar Mk 2 (FV12002) of the Royal Netherlands Army coupled to a Dutch semi-trailer. Note the trailer spare wheel carried in an upright position on the side of the swan neck.



● View of the rear suspension showing the chassis, drive shafts, suspension springs, torque-reaction arms, and the axles.

other with an experimental Meteorite modified to run on diesel fuel. One of these tractors was fitted with a fifth wheel, the other with a ballast body.

At the end of the trials, the ballast-bodied vehicle in combination with a drawbar trailer was said to offer the best manoeuvrability. It was, grudgingly, concluded that the petrol Meteorite offered the best all-round performance, whilst the diesel version offered the best fuel consumption... nevertheless, FVRDE and the War Office were determined that the next iteration of the Antar would be diesel powered.

FVRDE Exhibitions

Between 1954 and 1971, a series of bi-annual exhibitions were held at the main FVRDE site in Chertsey, in collaboration with the Society of Motor Manufacturers & Traders (SMMT). The exhibitions were intended to demonstrate the capabilities of various British military vehicles, with a view to selling them in export markets. The Mk 2 Antar was displayed at these exhibitions in 1952 and 1954, complete with the appropriate trailers.

ANTAR MK 2

● Overhead view of 32BP99, a Mk 2 fifth-wheel tractor, showing the Darlington 20-ton winch, the Davies Magnet fifth wheel, and the short trailer coupling guide rails. When compared to the Mk 1 tractor, the twin 100-gallon (454 litre) fuel tanks have been relocated to either side of the chassis, behind the cab, with storage lockers above them.

● Antar Mk 2 (FV12003) ballast-bodied tractor. This example has flashing indicator lights and additional rear-view mirrors, and has been fitted with the mount on the cab-roof for an anti-aircraft machine gun. The slinger rings on the front and rearmost wheels were only fitted to vehicles intended for export.

● Antar Mk 2 (FV12002) of the Royal Netherlands Army coupled to a semi-trailer loaded with a Centurion tank. Note the position of the tractor spare wheel. The low height of the trailer bed, when compared to British trailers, forces the tank to have to climb high over the trailer wheels before dropping down from the ramps.

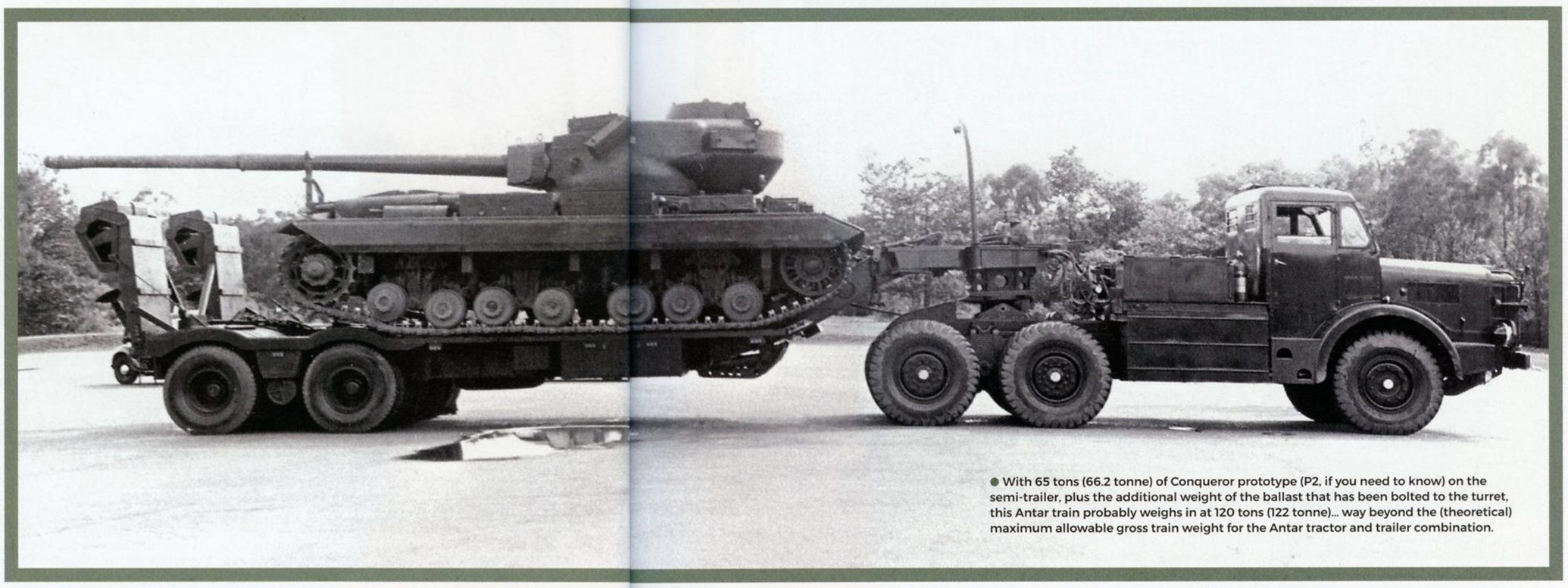
● Shiny, factory-fresh early-production Antar Mk 2 (FV12002) coupled to the 60-ton FV3001 semi-trailer produced by Joseph Sankey & Sons; the trailer runs on 16 wheels arranged on the axles in pairs. The position of the fuel tank, above the storage locker suggests that this could be a prototype.

Production

The Mk 2 tractors remained in production at Basingstoke until July 1957, with the total number supplied to the British Army being 353. This figure includes a single FV12002 vehicle for trials fitted with an RV-30 electro-pneumatic eight-speed automatic gearbox produced by Self Changing Gears Limited. The vehicle was submitted for trials in June 1958, at the end of which it was concluded that the gearbox saved a great deal of driver fatigue. Curiously, the gearbox was never subsequently specified for use in the military Antar, but was the standard offering on the commercial Antar Sandmaster, a special extra-duty truck with a 300bhp (223kW) six-cylinder Rolls-Royce engine and over-sized sand tyres.

By 1957, the maximum speed limit for oversized loads had been increased and the old Mk 1 and 2 Antars were clearly no longer up to the task. Work began on their replacement, concentrating, at first, on the selection of an appropriate engine.

● The vehicle is an Antar Mk 2 fifth-wheel tractor, registration number 54BH14, and the number 4713 stencilled in white paint on the cab door tells us that it was assigned to FVRDE for trials during 1954.



● With 65 tons (66.2 tonne) of Conqueror prototype (P2, if you need to know) on the semi-trailer, plus the additional weight of the ballast that has been bolted to the turret, this Antar train probably weighs in at 120 tons (122 tonne)... way beyond the (theoretical) maximum allowable gross train weight for the Antar tractor and trailer combination.

ANTAR MK 2

● Antar ballast-bodied tractor (FV12003) coupled to a Dyson/Cranes 50-ton drawbar trailer, photographed in the German snow.

● The stencilling on the cab door tells us that Lance Corporal Thomas is at the wheel of this Antar Mk 2 fifth-wheel tractor which is busy delivering new Centurion tanks, using the FV3011 50-ton semi-trailer. Centurions were built at the Royal Ordnance Factories at Barnbow (Leeds), Nottingham and Woolwich. The canvas shelter behind the cab provided overnight sleeping accommodation for the Antar crew.

● Antar fifth-wheel tractor (FV12002) running on trade plates, and carrying a partly-constructed Alvis Stalwart 5-ton amphibious truck on its semi-trailer. 71BR39 dates from 1955 and was constructed under contract 6/Veh/21396.

Registration numbers

The following registration numbers were issued to Mk 2 Antars, although the list is not necessarily complete:

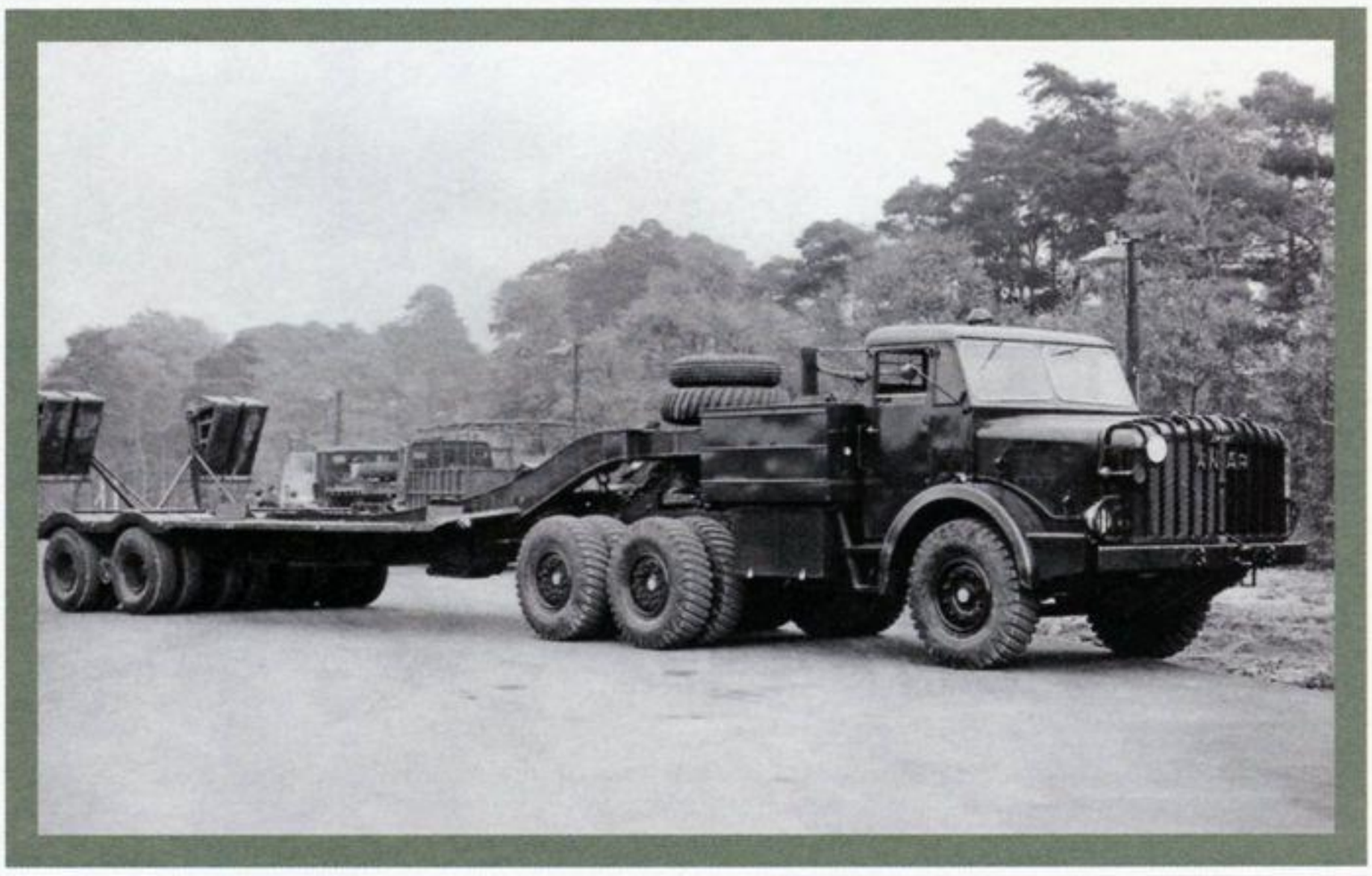
- 94BD75-95BD00
- 54BH01-54BH35
- 32BP99-33BP24
- 79BP70-79BP73
- 79BP86-80BP36
- 71BR13-71BR87
- 66BS87-67BS06

Other registrations for Antars operated by FVRDE, or other governmental bodies outside of the services, include NGY 75, NGY 560 and 561 and RGX 982.

Commercial Antars

The success of the Antar in Iraq inevitably led to other commercial sales, and, by mid-1955, Antars had also been supplied, among others, to Sir Robert McAlpine, Shell Petroleum, Steels Engineering, and HCL Sieberg, and were in use in locations as far apart as Australia, Burma, Egypt, Kuwait, the Netherlands, Sarawak, South Africa, Syria, and Venezuela.

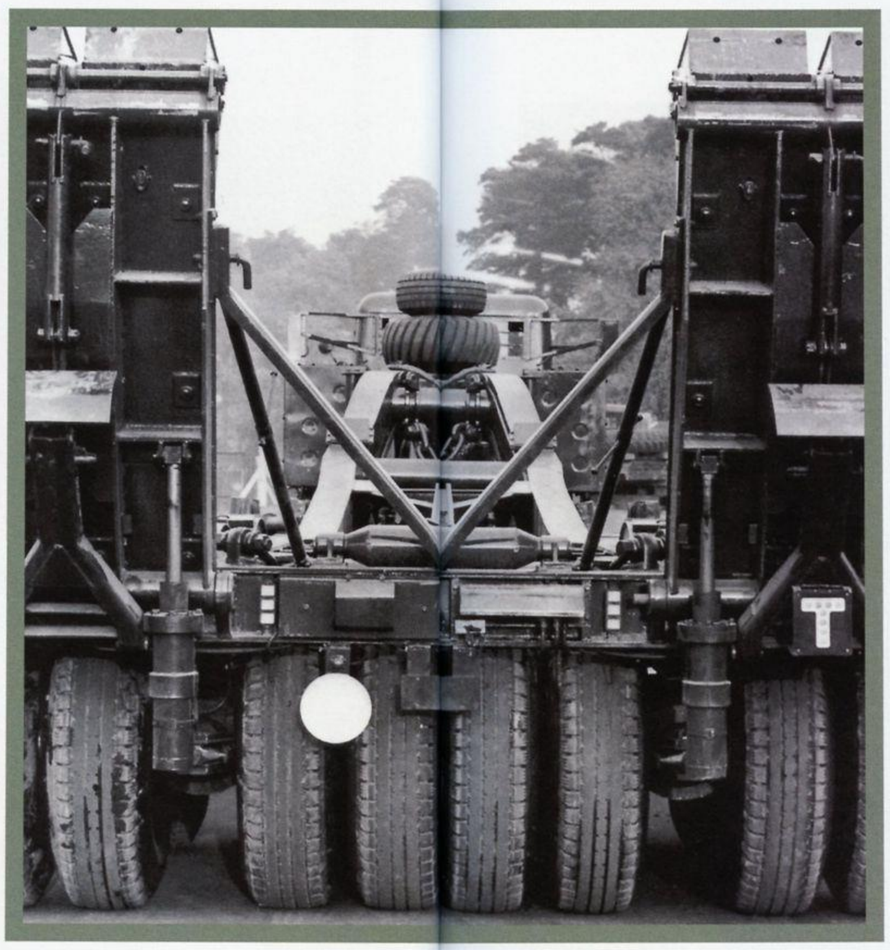
● Two more shots of what is possibly a prototype Mk 2 fifth-wheel tractor, complete with its FV3001 60-ton semi-trailer, photographed at Thornycroft's works and the FVRDE test site, respectively.



● Mk 2 fifth-wheel tractor (FV12002) with an empty FV3011 50-ton semi-trailer, possibly running light after delivering a new tank.

● Rear view of a Mk 2 ballast-bodied tractor (FV12003) of the Royal Netherlands Army.

● Fifth-wheel Mk 2 (FV12002) hauling a Centurion FV4006 armoured recovery vehicle (ARV) on the FV3011 50-ton semi-trailer.



● BELOW It's not entirely clear what is going on here but this Mk 2 fifth-wheel tractor (FV12002), finished in an interesting striped camouflage pattern, is being recovered by a crawler tractor, and appears to have some engine or transmission parts stacked on top of the winch.

● ABOVE Prototype for the FV3001 60-ton semi-trailer photographed at FVRDE during early trials. The design of the ramps and support legs were changed before the trailer went into production.

EXHIBIT NO. **11 & 12** **F.V. 12002**

Tractor 30 ton 6 x 4 G.S. (Thornycroft Antar) for Semi-Trailer

Description: This vehicle is the prime mover for the heavy road transportation trains, working with the 50-ton and 60-ton Semi-Trailers F.V. 3011 and F.V. 3001 respectively. The tractor is basically a commercial vehicle—the Thornycroft Mighty Antar—modified to meet Service requirements.

Height: 10′ 4″ (*3·150 m.*). Length: 26′ 9½″ (*8·166 m.*).
Width: 10′ 3″ (*3·124 m.*).
Track: Front 7′ 4½″ (*2·254 m.*). Rear 7′ 6½″ (*2·292 m.*).
Wheelbase: 15′ 6″ (*4·724 m.*).
Weight: Unladen 43,244 lb. (*19,630 kg.*).
Speed, maximum, road: 28 m.p.h. (*45·062 km./h.*).
Range of action at average maximum speed (laden): 250 miles (*400 km.*).
Gross power-weight ratio (b.h.p. per ton): (laden) 2·5
Maximum tractive effort, low gear (lb. per ton): 622 fully laden train (100% efficiency on nett torque).

32

EXHIBIT NO. **11 & 12**

TECHNICAL DATA

Power Unit
Engine: Meteorite 8-cyl. petrol.
Piston displacement: 18,000 c.c.
B.H.P. (gross): 285 at 2,000 r.p.m.
Torque (nett): 800 at 1,200 r.p.m.
Governed speed: 2,000 r.p.m.
Ignition (type): Magneto, 24 volts.

Fuel System
Air cleaner: F.V.R.D.E. oil bath.
Fuel capacity: 200 gallons.

Engine Lubrication
System: Dry sump, forced feed.

Engine Cooling
System: Pressurised.

Wheels
Rims: 4 piece disc type.
Tyres: 14·00″ × 24″ C.C.
Tyre pump: Inflator hose from air pressure brake system.

Transmission
Clutch or coupling: Single plate, air assisted.
Gearbox: 4-speed constant mesh.
Transfer box: 3-speed.
Propeller shafts: Hardy-Spicer.
Axles: Fully floating rear.
Ratios: 10·44 top, 149 bottom.
Differentials: Two.

Brakes
Foot: Air operated, drum pattern.
Hand: Mechanical, rear only.
Servo mechanism: 2 line air system.

Steering
System: Cam and double roller.
Servo mechanism: Hydraulic.

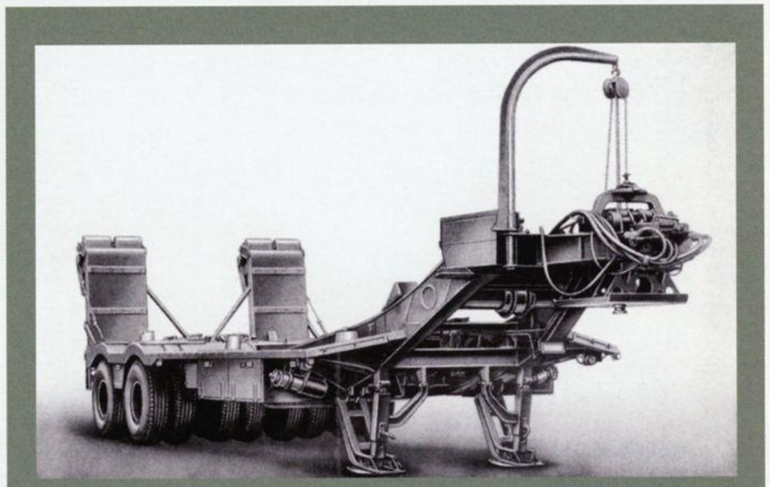
Suspension
Front: Semi-elliptic.
Rear: Semi-elliptic.
Shock absorbers: None.

MANUFACTURER

TRANSPORT EQUIPMENT (THORNYCROFT) LTD., Basingstoke, Hants.

33

● Pages 32 and 33 of the catalogue handed to visitors at the 1956 FVRDE Exhibition of British military vehicles held at the Chertsey site.

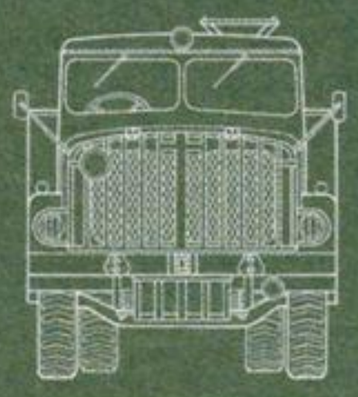


● Manufactured by Joseph Sankey & Sons, the FV3001 60-ton semi-trailer, shown with the crane for handling the tractor spare wheel in position. The long wheelbase of the tractor-trailer combination helped to reduce loads imposed on military bridges.

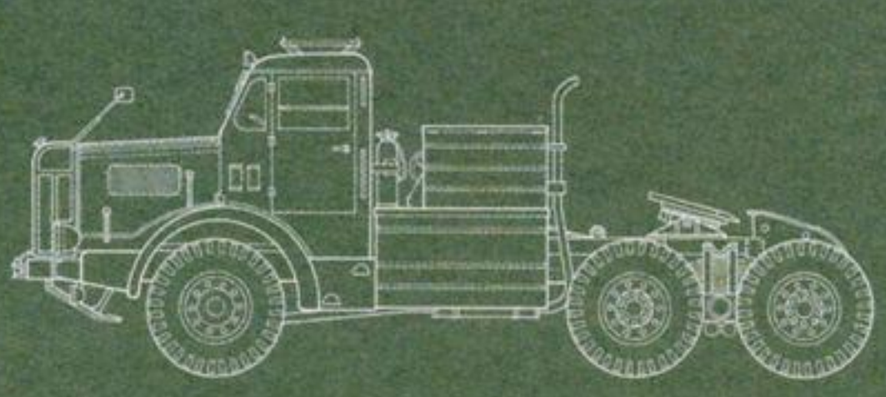
FACTS & FIGURES - MK 2, FV12002 AND FV12003 ANTARS

	FV12002 (fifth wheel)		FV12003 (ballast body)	
Engine: Rover Meteorite Mk 204, petrol				
Cylinders	60˚ V8		60˚ V8	
Capacity	18,019cc	1099in³	18,019cc	1099in³
Bore and stroke	5.4 x 6in	137.1 x 152.4mm	5.4 x 6in	137.1 x 152.4mm
Fuel	68-70 octane petrol		68-70 octane petrol	
Power output at 2000rpm				
gross	260bhp	193kW	260bhp	193kW
net	250bhp	186kW	250bhp	186kW
Maximum torque at 1200rpm	860 lbf/ft	1166Nm	860 lbf/ft	1166Nm
Dimensions and weight				
Overall length	321in	8160mm	333in	8466mm
Overall width	123in	3124mm	126in	3200mm
Height to top of cab	120in	3050mm	120in	3050mm
Wheelbase	186in	4724mm	186in	4724mm
Bogie centres	62in	1575mm	62in	1575mm
Ground clearance				
front axle	16.5in	419mm	16.5in	419mm
rear axle	15.5in	394mm	15.5in	394mm
belly	21in	533mm	21in	533mm
Turning circle (solo)	68ft	20.74m	68ft	20.74m
Weight				
unladen	19.4 ton	19.75 tonne	19.75 ton	20.11 tonne
laden	51 ton	51.80 tonne	34.75 ton*	35.38 tonne*
maximum permissible axle laden weight				
front	10.15 ton	10.3 tonne	7.65 ton	7.79 tonne
rear	40.85 ton	41.5 tonne	12.1 ton	12.3 tonne
maximum gross train weight	100 ton	102 tonne	100 ton	102 tonne
Performance				
Fuel consumption	1mpg	0.35km/litre	1mpg	0.35km/litre
Maximum speed				
overdrive (top)	28mph	45.5km/h	28mph	45.5km/h
direct	20.5mph	33.2km/h	20.5mph	33.2km/h
Maximum grade (solo)	18%	1 in 5.6	18%	1 in 5.6

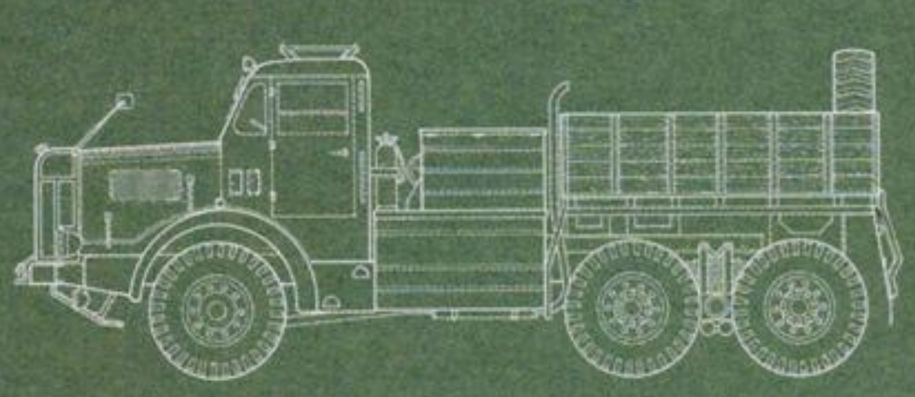
* Weight includes 15 ton (15.27 tonne) of ballast



● Front elevation, Antar Mk 2, FV12002 and FV12003



● Side elevation, Antar Mk 2, FV12002



● Side elevation, Antar Mk 2, FV12003

DIESEL POWER AT LAST!

The much-improved Antar Mks 3 and 3A (FV12004, FV12006) make their debut

The War Office had always wanted the Antar to be powered by a diesel engine, and trials had already been carried out back in 1956, comparing diesel-engined tractors with the standard petrol-powered Meteorite. One was fitted with a Rolls-Royce C6SFL supercharged six-cylinder diesel engine, the other with an experimental Meteorite modified to run on diesel. But, the die was already cast, and, in the end, it was the Rolls-Royce C8SFL eight-cylinder unit that was chosen for the Antar Mk 3.

In early 1958, after production of the Antar had been halted for 10 months, the first Mk 3 was submitted for reliability trials. The use of the standard Thornycroft cab of the period, coupled with a narrower nose, made it look different from the Mk 1 and Mk 2. But the major changes were under the bonnet, where the new diesel engine was coupled to a simplified six-speed transmission designed to improve economy and performance.

Drawn from the Rolls-Royce 'C Range', the C8SFL was a water-cooled supercharged straight-eight power unit, producing a gross 333bhp (248kW) from a capacity of 16.2 litres. The supercharger was a Roots blower unit, and the fuel was injected directly into the combustion chambers. The torque characteristics of the diesel engine allowed the transmission to be redesigned and simplified, using a combined main and auxiliary constant-mesh gearbox with just six forward speeds controlled by a single change-speed lever. Sixth gear was an overdrive.

The suspension and braking systems were largely unchanged, although the power-steering system was redesigned

● Bulled-up and shiny, ready for display at the 1963 Commercial Motor Show, this Mk 3 Antar (FV12004) shows how the new cab and front end brought aesthetic improvements, rendering a generally more modern aspect to the tractor. As befits its status as a show vehicle, this tractor has been fitted with non-standard chromium-plated grab rails, and has been polished to within an inch of its life!

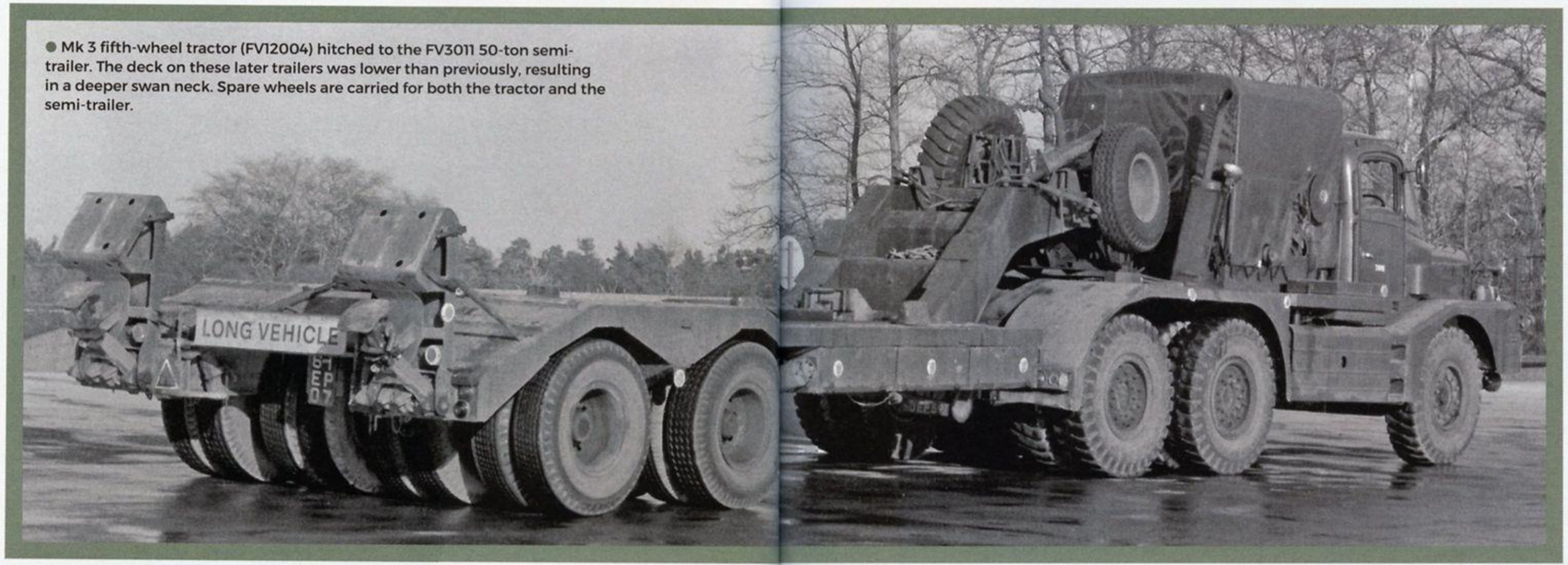
to improve assistance at slow speeds, and the inter-axle differential was fitted with a manual lock. The engine was fitted with a Clayton Oetiker exhaust brake that assisted with slowing the vehicle on down grades.

Constructed from twin-skin insulated pressed-steel panels, the new cab was similar to that used on other Thornycroft products of the period, albeit in this case it was widened by the insertion of additional sheet metal in the centre. The twin radiators that were such a distinctive feature of the Mk 1 and Mk 2 Antars were replaced by a single unit that allowed the nose to be narrowed. There was a degree of mis-matching where the bonnet met the scuttle, but overall the appearance was considerably improved. The front wings were similarly redesigned, with flat front and top panels, the latter being fitted with strips of treadplate to provide a platform that would improve access to the engine compartment. Early production vehicles, or it may just have been the three prototypes, had fixed glazing to the windscreen; on later vehicles the windscreen was divided horizontally, with a small opening section at the bottom.

On most examples, a circular hatch in the cab roof, normally provided with a canvas cover, allowed the passenger to operate an anti-aircraft machine gun.

A 20-ton Turner winch was installed behind the cab and was chain-driven by a power take-off on the gearbox. A

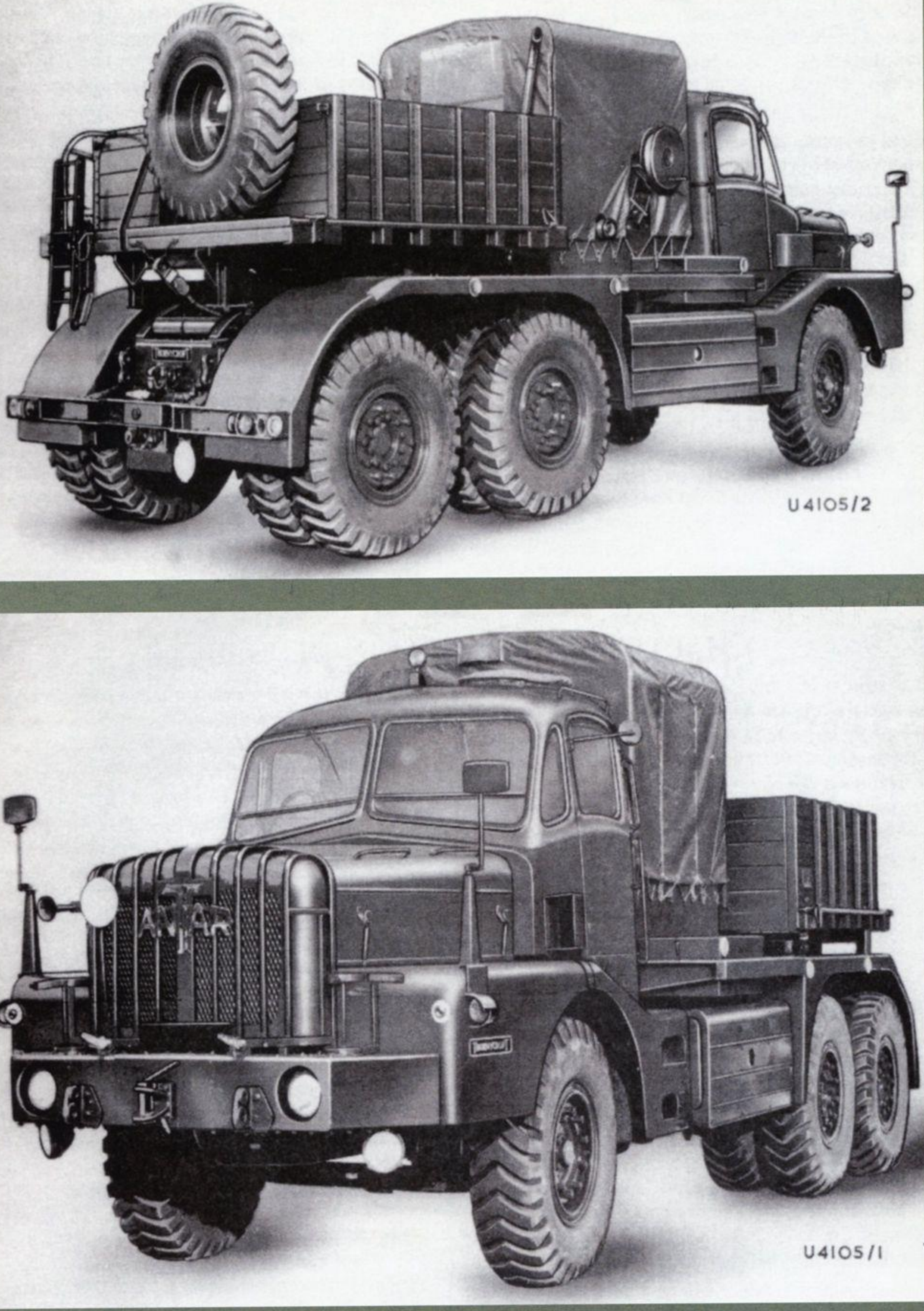
● Mk 3 fifth-wheel tractor (FV12004) hitched to the FV3011 50-ton semi-trailer. The deck on these later trailers was lower than previously, resulting in a deeper swan neck. Spare wheels are carried for both the tractor and the semi-trailer.



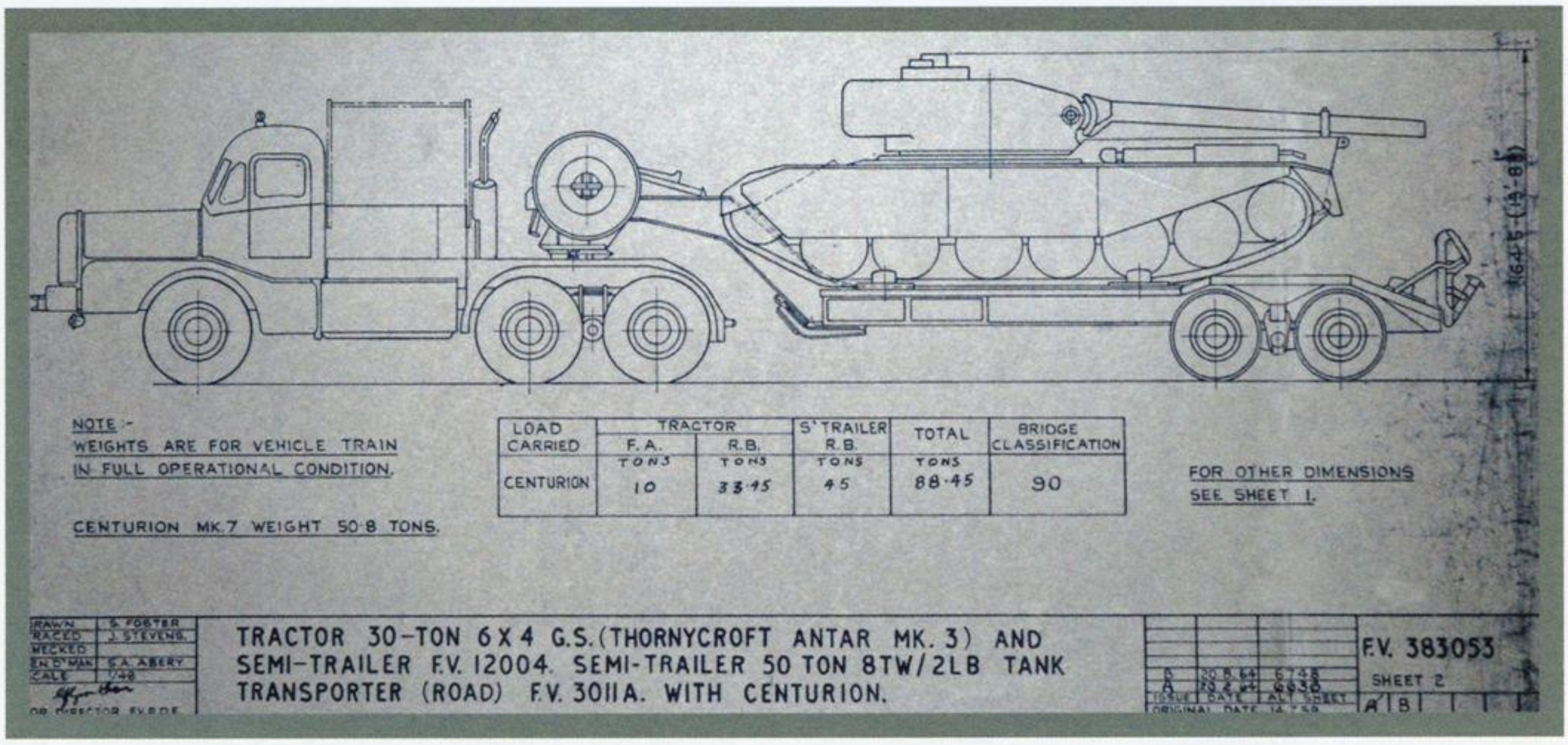
● Factory-fresh Mk 3A ballast tractor, resplendent in its coat of Deep Bronze Green (shade 224, BS 381C) gloss paint; once in service, some vehicles were subsequently over-painted with NATO matt green, sometimes with a disruptive camouflage pattern.

● Largely complete, and in what might be called 'good used' condition, this surplus Mk 3 (FV12004) is in private hands.

ANTAR MKS 3/3A



● Viewed from the front and rear, this is the Mk 3A (FV12006) ballast-bodied Antar. Both photographs are taken from the War Office User Handbook.



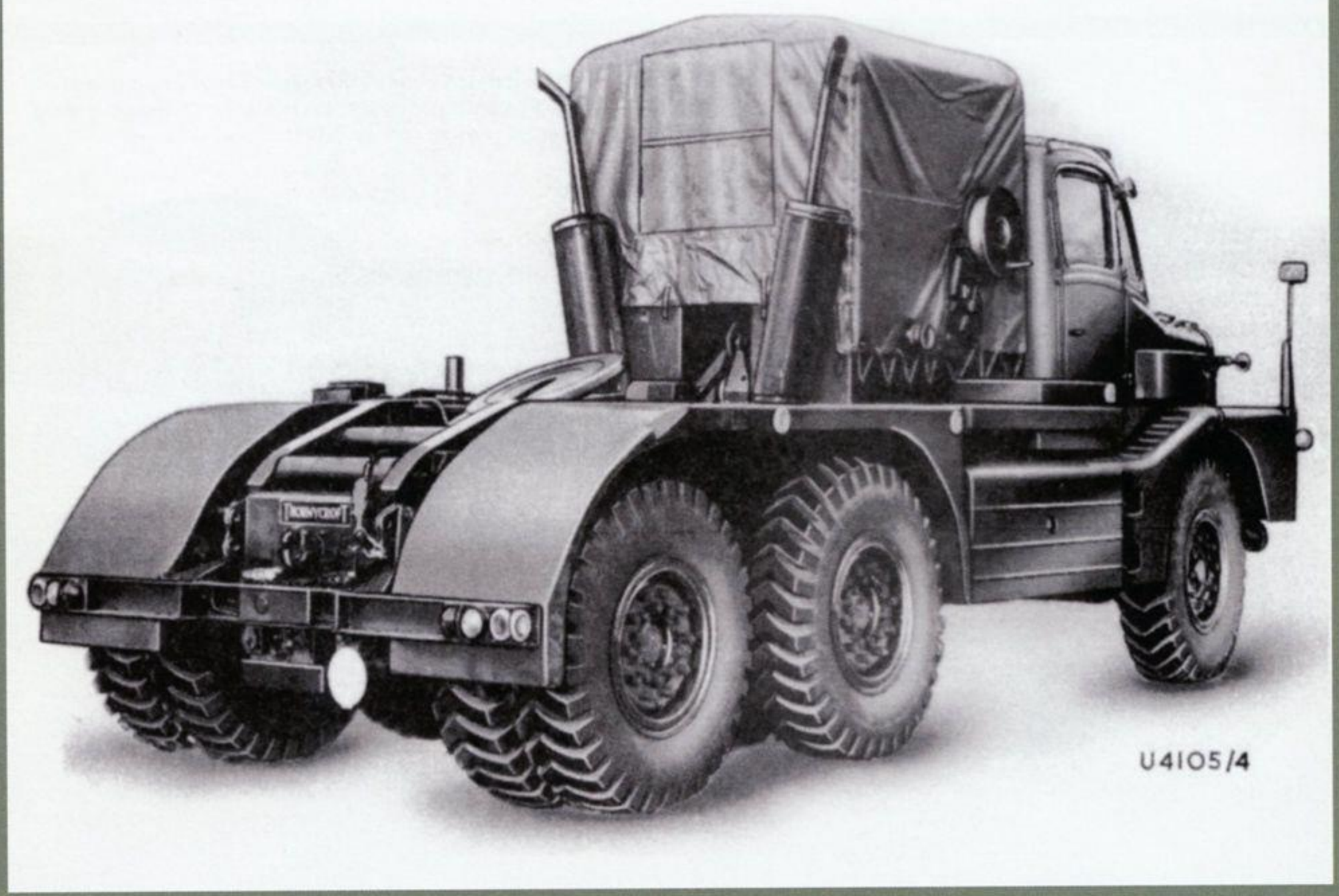
● FVRDE outline drawing showing the dimensions and weights of a loaded Mk 3 (FV12004) Antar together with an FV3011 semi-trailer carrying a Centurion Mk 7 tank.

tubular steel framework was installed over the winch, and was supplied with a covering tarpaulin to provide weather protection for the winch itself, and overnight accommodation for the crew. Ballast tractors also carried a spare wheel, together with handling gear, either behind the cab or in the ballast box.

Work on building three prototype Mk 3s had started in July 1957, with the first example delivered to FVRDE in March 1958 for trials. The truck was run for around 11,000 miles (17,500km) and a report was issued at the end of the year, listing some 21 relatively minor points that needed attention. Most notable, however, was the tendency for the transmission and axle oils to overheat, a problem which had first been noted with the Mk 1, but which had never really been solved. High-speed running exacerbated the problem, with the oil of the Mk 3 overheating after just one hour of running at full speed. Eventually, a modified axle was developed which minimised the problem.

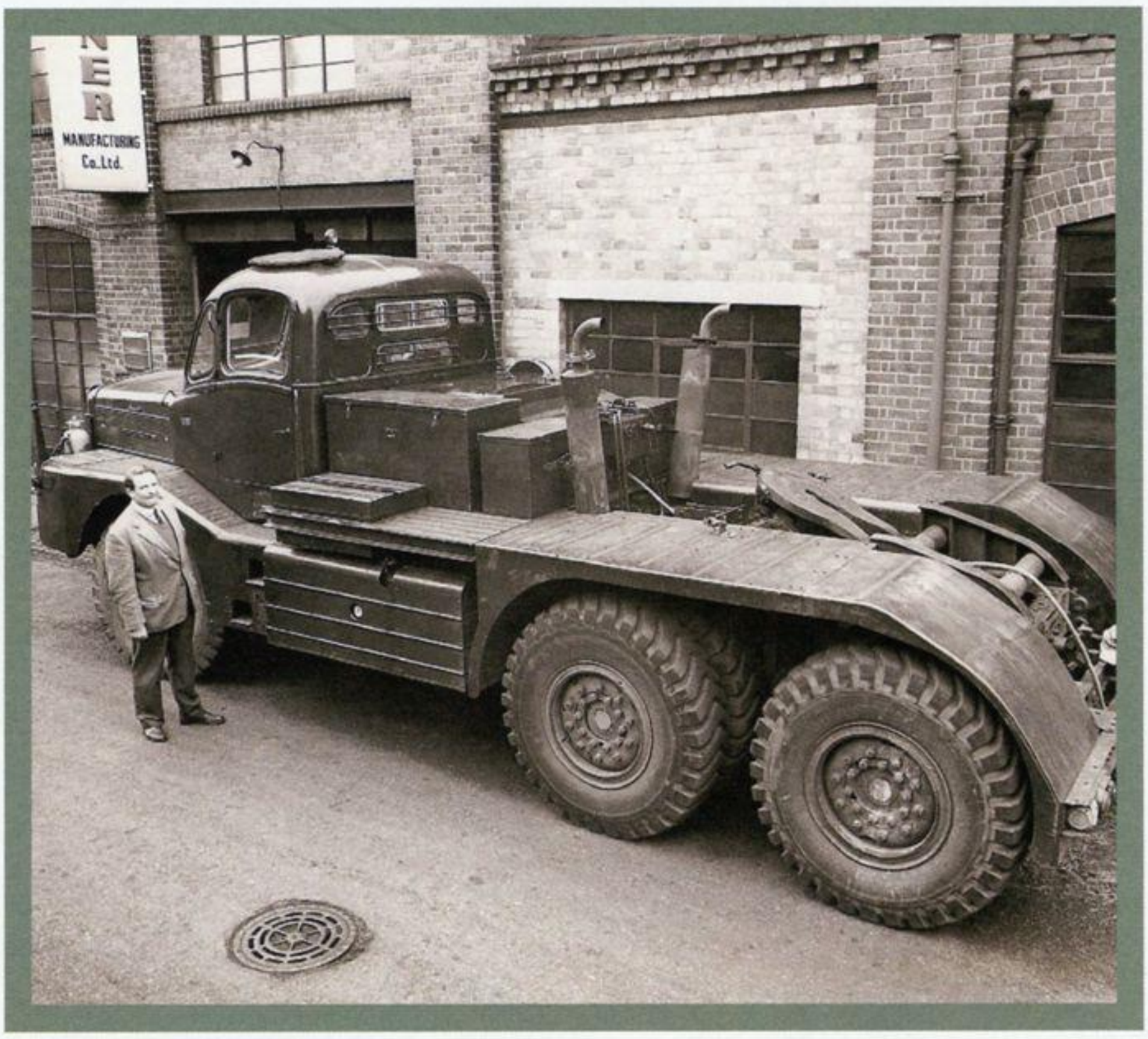
● Antar Mk 3, standing alongside a Leyland Martian FV1100 series artillery tractor and a closed-cab Diamond T Model 980. The WW2 Diamond T was the British Army's standard tank transporter until the Antar started to enter service in 1951.

ANTAR MKS 3/3A



● Front and rear three-quarter views of the Mk 3 fifth-wheel tractor (FV12004). Both photographs are taken from the War Office User Handbook.

● Impressive line-up of Mk 3 R6 or R8 Antars at the Thornycroft factory. These are not intended for the British Army, and it is not known why the front NATO hitch has been removed in every case; logic would suggest that it is something to do with shipping.



● Photographed outside the Wolverhampton works of the Turner Manufacturing Company, this Mk 3 Antar, was originally registered RGX 983 and was assigned to FVRDE at Chertsey; it was subsequently renumbered as 61EP10. Although the winch is in the normal position, it appears to be fitted inside a non-standard box-like enclosure.

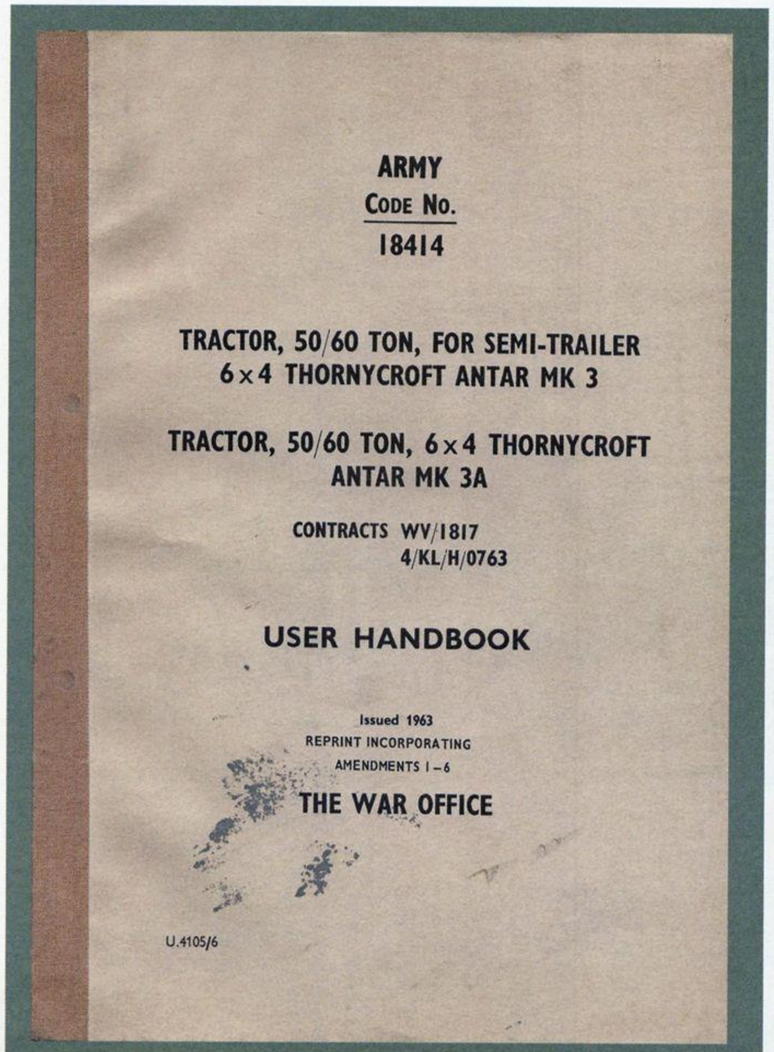
Notwithstanding the problems encountered during the trials programme, the Mk 3 was better in almost every respect. The top speed was improved by almost 20% and the fuel consumption was reduced to a far more sensible figure.

Production started in April 1961, and the first Mk 3 to appear was the fifth-wheel variant, designated FV12004. This was soon followed by the Mk 3A ballast tractor (FV12006), fitted with a removable steel-framed wooded ballast box. All Mk 3 and 3A Antars were fitted with a fifth wheel, regardless of whether or not there was also a ballast box.

Trials carried out in 1961 showed that the earth-mover tyres that had been fitted to Antars since the first Mk 1s were not really suitable for continuous high-speed running. FVRDE announced that it would investigate suitable alternatives and the War Office user handbook dated 1963, describes the tyres as 20-ply 'cross country'

FVRDE Exhibitions

The Mk 3 Antar was displayed at the FVRDE exhibitions in 1962, 1966, 1971 and 1981, complete with the appropriate trailers.



ARMY
CODE No.
18414

TRACTOR, 50/60 TON, FOR SEMI-TRAILER
6×4 THORNYCROFT ANTAR MK 3

TRACTOR, 50/60 TON, 6×4 THORNYCROFT
ANTAR MK 3A

CONTRACTS WV/1817
4/KL/H/0763

USER HANDBOOK

Issued 1963
REPRINT INCORPORATING
AMENDMENTS 1–6

THE WAR OFFICE

U.4105/6

● User Handbook for the Antar Mks 3 and 3A; Army Code 18414. This is a reprint, issued in 1963, incorporating amendments 1 to 6, and describes the features of the vehicle, explains standard operating procedures, and outlines the maintenance tasks that are to be undertaken by the crew.

Refurbishment

In the late 'seventies, by which time most of the Mk 3/3A Antar fleet was nearing 20 years in service, every British Antar, regardless of whether it was located in West Germany or the UK, was shipped to Liverpool for refurbishment by the Fazakerley Engineering Company Limited.

Based at the former RAF Fazakerley and using workshops and equipment still owned by the Ministry of Defence, the company painstakingly stripped each tractor to its major components before repairing or replacing as necessary and then reassembling the truck to a condition which was said to be better than new. Engines were either overhauled at Rolls-Royce, or refurbished at Fazakerley. At the end of this process, which took 12 weeks of workshop time for each vehicle, the truck was put through a 60-mile (100km) test using steel tanks – not the military kind! – filled with sand to simulate the weight of a Chieftain tank. The test route chosen by the company for these trials included a long uphill section on the M6 designed to simulate running on the German *autobahns*.

The Antar Mk 3/3A remained in service with the British Army until 1986-87, by which time tank-transporter duties had been passed to the Scammell Commander.

● Registered 12DM41, this Mk 3A Antar (FV12006) has been over-painted with NATO green before having disruptive shadow patterns applied.

● Rear three-quarter view of the Mk 3 tractor destined for Earl's Court and the Commercial Motor Show in 1963.

● Both the Mk 3 and the Mk 3A were fitted with a fifth wheel, meaning that the ballast box could be easily removed to convert the vehicle from one configuration to the other.

● Two Antars nearing completion, and a Nubian that has yet to receive its body, photographed in the erecting shop at Basingstoke.

● Antar Mk 3 (FV12004); note the scoops fitted to the scuttle to increase air flow into the cab when the vehicle was moving.

● Equipped as a fifth-wheel tractor, 12DM24 was one of a batch of 150 vehicles supplied in 1961, under contract KL/H/0763.

● Photographed during a rest stop, this Mk 3A ballast-bodied tractor is coupled to the FV3601 50-ton draw-bar trailer.

ANTAR MKS 3/3A

● Antar Mk 3 coupled to the FV3011 semi-trailer. The number 7109 stencilled onto the cab door indicates that the vehicle is undergoing some kind of FVRDE trial.

Production

The total production of the Mk 3/3A Antar for the British Army is believed to be 218 or more.

Registration numbers

The following registration numbers were issued to Mk 3/3A Antars:

- 16CL78
- 11DM93-13DM42
- 50EK30-50EK84
- 60EP54-59
- 28ES11-28ES12

At least two Antars Mk 3 were assigned to FVRDE, where they were registered RGX 983 and CYY 725C.

Trailers

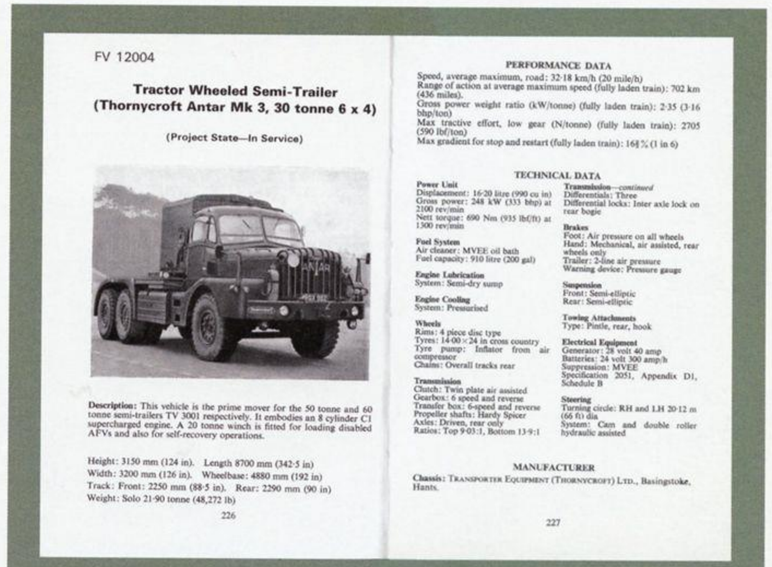
The FV12004 tractor was equipped with a fifth wheel for use with the FV3001 60-ton semi-trailer, or the later variant, which was designated FV3005; it was also possible to couple the tractor to the FV3011 50-ton semi-trailer.

Like the Mk 1 and Mk 2 tractors, the FV12006 was generally coupled to the FV3601 50-ton drawbar trailer, which survived in service into the early 'eighties.

Experimental engine

In 1957/58, perhaps in a bid to save money, automotive trials were conducted at FVRDE with a pair of Antar tractors powered by an AEC AVT1100 diesel engine, producing 253bhp from a capacity of 17.75 litres. The tractors that were constructed to trial this engine should have been described as a Mk 2.5... with the narrow nose of the Mk 3, a chassis that had been elongated by about 12 inches (305mm) at the front and a bonnet to match, combined with the more perpendicular cab, and the rounded front mudguards of the Mks 1 and 2. On at least one of the trials vehicles, there were huge twin air cleaners positioned on the left-hand front mudguard.

The engine had been developed for use in heavy traction duties, for example in plant or large dump trucks which had made the War Office curious as to whether it would provide a suitable



FV 12004

Tractor Wheeled Semi-Trailer (Thornycroft Antar Mk 3, 30 tonne 6 x 4)

(Project State—In Service)

Description: This vehicle is the prime mover for the 50 tonne and 60 tonne semi-trailers TV 3001 respectively. It embodies an 8 cylinder C1 supercharged engine. A 20 tonne winch is fitted for loading disabled AFVs and also for self-recovery operations.

Height: 3150 mm (124 in). Length 8700 mm (342·5 in)
Width: 3200 mm (126 in). Wheelbase: 4880 mm (192 in)
Track: Front: 2250 mm (88·5 in). Rear: 2290 mm (90 in)
Weight: Solo 21·90 tonne (48,272 lb)

226

PERFORMANCE DATA

Speed, average maximum, road: 32·18 km/h (20 mile/h)
Range of action at average maximum speed (fully laden train): 702 km (436 miles).
Gross power weight ratio (kW/tonne) (fully laden train): 2·35 (3·16 bhp/ton)
Max tractive effort, low gear (N/tonne) (fully laden train): 2705 (590 lbf/ton)
Max gradient for stop and restart (fully laden train): 16¾% (1 in 6)

TECHNICAL DATA

Power Unit
Displacement: 16·20 litre (990 cu in)
Gross power: 248 kW (333 bhp) at 2100 rev/min
Nett torque: 690 Nm (935 lbf/ft) at 1300 rev/min

Fuel System
Air cleaner: MVEE oil bath
Fuel capacity: 910 litre (200 gal)

Engine Lubrication
System: Semi-dry sump

Engine Cooling
System: Pressurised

Wheels
Rims: 4 piece disc type
Tyres: 14·00 × 24 in cross country
Tyre pump: Inflator from air compressor
Chains: Overall tracks rear

Transmission
Clutch: Twin plate air assisted
Gearbox: 6 speed and reverse
Transfer box: 6-speed and reverse
Propeller shafts: Hardy Spicer
Axles: Driven, rear only
Ratios: Top 9·03:1, Bottom 13·9:1

Transmission—*continued*
Differentials: Three
Differential locks: Inter axle lock on rear bogie

Brakes
Foot: Air pressure on all wheels
Hand: Mechanical, air assisted, rear wheels only
Trailer: 2-line air pressure
Warning device: Pressure gauge

Suspension
Front: Semi-elliptic
Rear: Semi-elliptic

Towing Attachments
Type: Pintle, rear, hook

Electrical Equipment
Generator: 28 volt 40 amp
Batteries: 24 volt 300 amp/h
Suppression: MVEE Specification 2051, Appendix D1, Schedule B

Steering
Turning circle: RH and LH 20·12 m (66 ft) dia
System: Cam and double roller hydraulic assisted

MANUFACTURER

Chassis: Transporter Equipment (Thornycroft) Ltd., Basingstoke, Hants.

227

● Pages 226 and 227 of the catalogue handed to visitors at the 1971 FVRDE Exhibition of British military vehicles held at the Chertsey site. The Mk 3 and 3A also appeared at the exhibition in 1962, 1966 and 1981.

ANTAR MKS 3/3A

● The front end of the AEC-powered tractor appears to be complete but the rear has yet to be finalised: there are no mudguards, stowage lockers or fuel tanks... or is it simply that there were two prototypes?

● The date of the photograph is not known but it shows the standard Antar Mk 3 (FV12004) fifth-wheel tractor, standing alongside the hybrid vehicle – Mk 2.5, if you like – that was constructed with an AEC AVT1100 diesel engine in 1957. This vehicle might have been identified as FV12005.

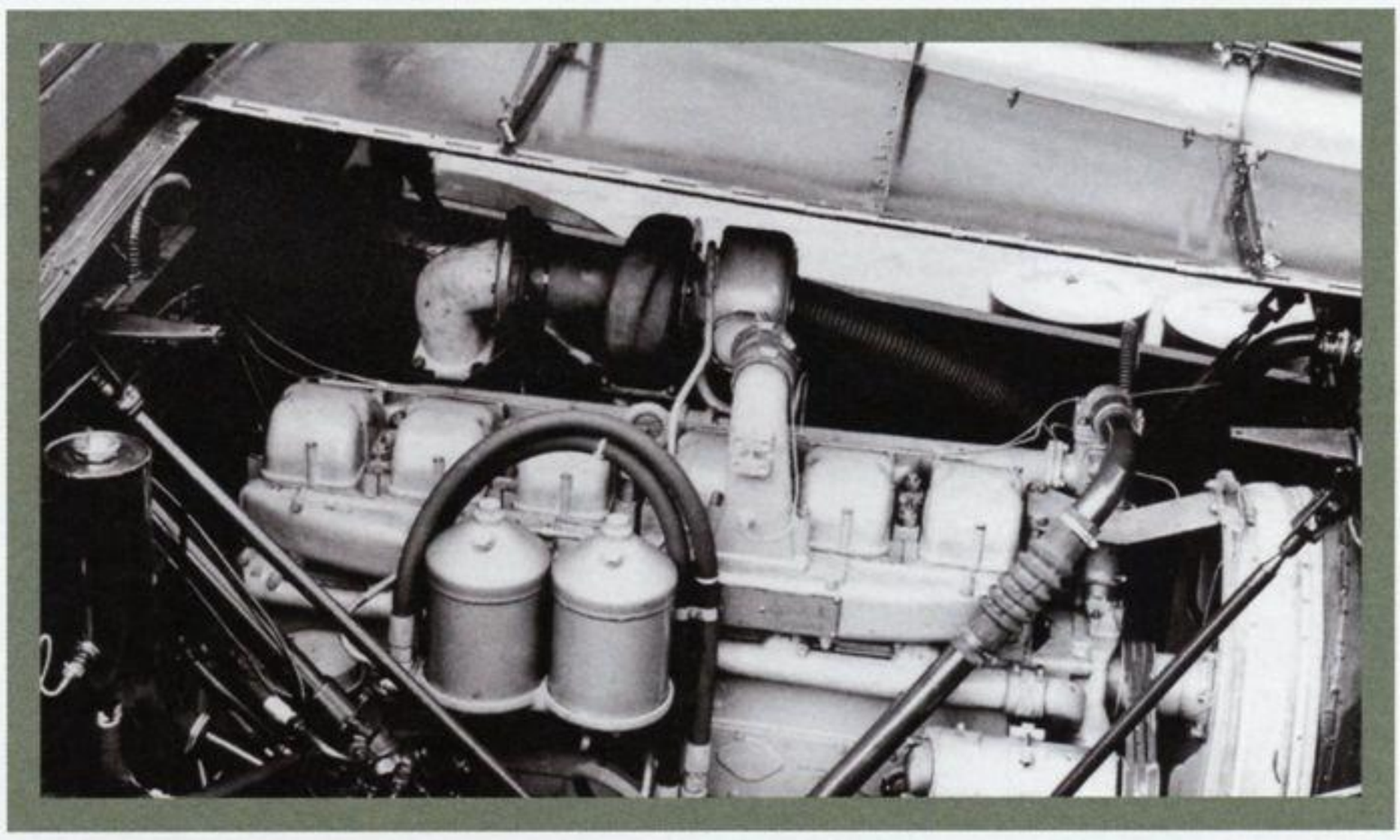
power unit for the Antar Mk 3, at a considerably lower cost than either the Meteorite or the Rolls-Royce C Series.

At the end of the trials, FVRDE concluded that the engine had performed well, and would be at least equal to the Meteorite in day-to-day running. The maximum speed, loaded, was 28mph (44km/h), but the torque characteristics were an improvement on the petrol Meteorite. Unfortunately, high noise levels in the cab, at anything more than moderate engine speeds, were said to be very tiring to the crew.

No further action was taken. The trucks hung around Chertsey for some years, being finally disposed of in 1971, and the report of the trials was not published until 1963.

Commercial Antars

It is worth remembering that the Antar was not originally envisaged as a tank transporter and throughout the production life of the vehicle examples continued to be sold to oil-exploration companies, and to civil-engineering customers or others who had large or oversized loads to shift. Most commercial Antars, as well as those tractors supplied to the armies of other nations, were little more than a simplified, or de-militarised, version of the standard tank transporter... or perhaps it might be more honest to state that the Antar tank transporter was little more than a militarised version of the original civilian machine!



● AEC AVT1100 17.75-litre diesel engine fitted under the extended bonnet of the hybrid Antar. In use, at anything other than moderate engine speeds, the engine proved to be very noisy.

● Side elevation shows the extended nose necessary to house the AEC engine, married to the rounded front mudguards and perpendicular cab of the Mk 2.

● Standing side by side for comparison, the standard Antar Mk 3 (FV12004) fitted with the eight-cylinder Rolls-Royce C8 engine, compared to the hybrid tractor powered by an AEC AVT1100 six-cylinder engine.

● There was no room for the twin air cleaners under the bonnet, nor was there space under the front mudguard... which was where the air cleaners were placed on the standard Mk 3/3A tractors. The only space left was on the left-hand front mudguard.

However, be that as it may, by the time the Mk 3 appeared, a number of engine options were also being made available. The standard British Army engine was the Rolls-Royce C8SFL; other engines available included the Rolls-Royce C6T, a six-cylinder turbo-charged unit producing a gross 300bhp (223kW), and the C8T, an eight-cylinder unit producing 450bhp (335kW) gross. Tractors fitted with these engines were identified as the Mighty Antar R6 or Mighty Antar R8, with a simplified version omitting certain features, described as the R8S.

● Head-on view of the Mighty Antar R6 tractor supplied to the RAF under the registration number 40AT81. Like all Antar R6 tractors, the vehicle was powered by a Rolls-Royce C6TFL six-cylinder turbo-charged diesel engine driving through a four-speed main gearbox and three-speed auxiliary box, and lacked many of the military details of the standard Antar.

● Commercial Mighty Antar R8 tractor as supplied to AEI in 1959 intended for moving heavy machinery for a power-station project in Argentina. The R8 was fitted with a supercharged Rolls-Royce eight-cylinder C8SFL engine, and retained the 12-speed transmission of the earlier models.

● View of the Darlington type 70 winch on the AEI Mighty Antar R8.

● Front three-quarter view of the AEI Mighty Antar R8; note the slinger rings on the front and rear wheels, intended to allow the vehicle to be lifted on board a ship.

● Mighty Antar R6 or R8 tank transporter, one of a batch of tractors supplied to a Middle Eastern customer during 1960/61.

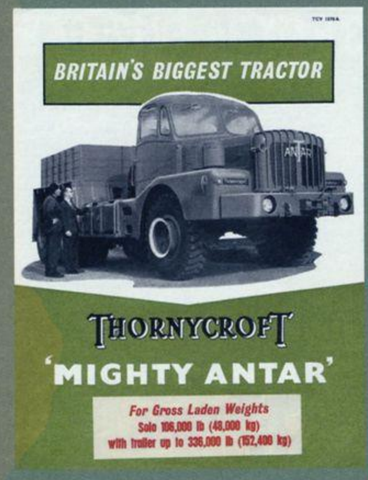
At least one C6T-engined Mk 3 was operated by the RAF at Cardington, under the registration number 40AT81, possibly designated FV12007. A further 38 tank transporter tractors, to a similar specification, were supplied to the armies of Burma (Myanmar), Kuwait, Pakistan and South Africa.

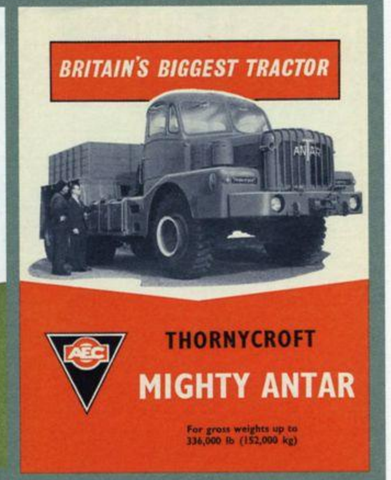
Thornycroft also stated that, 'in special circumstances', they were willing to consider fitting other engines, including those of American origin.

● Antar Mk 3 (FV12004) complete with FV3001 50-ton semi-trailer; note the unusual (for the Army) reflective number plate, and the use of white paint on the lamp guards and bumper ends, both of which contrast with the poorly-repaired door skin.

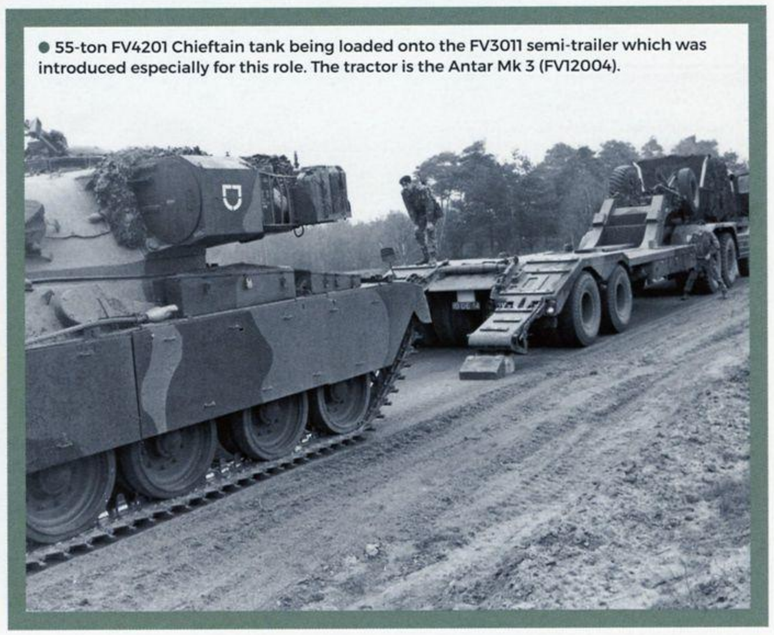
● Near right Dated July 1961, Thornycroft publication number TCV 1570A, extols the virtues of the Mighty Antar, quoting gross train weights of 106,000 lb (48,000kg) when running solo, and 336,000 (152,400kg) with a trailer. The illustration is of a ballast-bodied R8 Antar, similar in specification to the vehicles supplied to the War Office, but as supplied to AEI, Birmingham for export to Argentina.

● Far right/below Produced 18 months later, in October 1963, the colour has changed to red and the leaflet has gained an AEC logo, but the message remains the same... the Antar is still Britain's biggest tractor! The inside spread includes the original Iraq Petroleum Company tractors, as well as a mix of commercial and military examples.





Towards the end of the 'fifties, a degree of confusion started to arise between the Antar and Big Ben model ranges, with the Thornycroft-engined MA/K6, MA/K6S, MA/KRN6 and MA/KRN6S chassis being marketed as Antars, alongside the Rolls-Royce engined Antar Sandmaster that was sold to Esso for service in Libya. These models seem to have been distinguished from the existing vehicles by the omission of the word 'Mighty' from the model name... although this was not much help to those more used to the military tank transporters which were generally always described simply as 'Antar'!

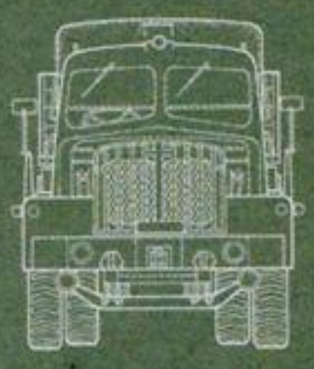


● 55-ton FV4201 Chieftain tank being loaded onto the FV3011 semi-trailer which was introduced especially for this role. The tractor is the Antar Mk 3 (FV12004).

FACTS & FIGURES - MK 3 & MK 3A, FV12004 & FV12006 ANTARS

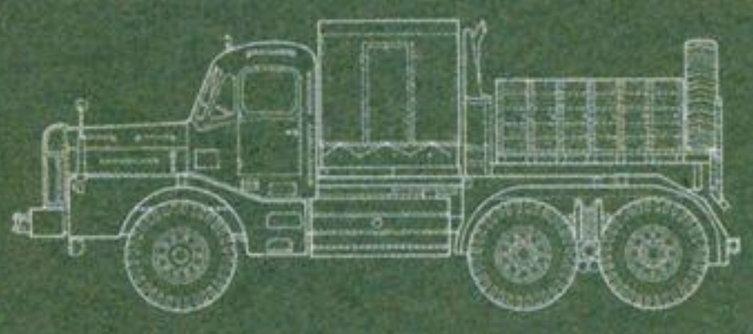
	FV12004 (fifth wheel)		FV12006 (ballast body)	
Engine: Rolls-Royce C8SFL-843, diesel				
Cylinders	8 in-line		8 in-line	
Capacity	16,200cc	990in³	16,200cc	990in³
Bore and stroke	5.125 x 6in	130.21 x 152.4mm	5.125 x 6in	130.21 x 152.4mm
Fuel	diesel oil		diesel oil	
Power output at 2100rpm				
gross	333bhp	248kW	333bhp	248kW
net	313bhp	233kW	313bhp	233kW
Maximum torque at 1200rpm	934 lbf/ft	1266Nm	934 lbf/ft	1266Nm
Dimensions and weight				
Overall length	342in	8693mm	342in	8693mm
Overall width	126in	3200mm	126in	3200mm
Height to top of cab	122in	3098mm	122in	3098mm
Wheelbase	192in	4877mm	192in	4877mm
Bogie centres	62in	1575mm	62in	1575mm
Ground clearance				
front axle	16.5in	419mm	16.5in	419mm
rear axle	15.5in	394mm	15.5in	394mm
belly	21in	533mm	21in	533mm
Turning circle (solo)	70ft	21.33m	70ft	21.33m
Weight				
unladen	21 ton	21.4 tonne	23.4 ton	23.7 tonne
laden	50 ton	51.80 tonne	34.75 ton	35.38 tonne
maximum permissible axle laden weight				
front	9 ton	9.15 tonne	9 ton	9.15 tonne
rear	40.85 ton	41.6 tonne	12.1 ton	12.3 tonne
maximum gross train weight	111 ton	113.5 tonne	111 ton	113 tonne
Performance				
Fuel consumption	2mpg	0.79km/litre	2mpg	0.79km/litre
Maximum speed				
overdrive (top)	32mph	52km/h	32mph	52km/h
direct	24mph	38km/h	24mph	38km/h
Maximum grade (solo)	18%	1 in 5.6	18%	1 in 5.6

● Front elevation, Antar Mk 3, FV12004



● Front elevation, Antar Mk 3A, FV12006

● Side elevation, Antar Mk 3, FV12004



● Side elevation, Antar Mk 3A, FV12006

CENTURION, CHIEFTAIN AND CONQUEROR

The Antar in service in West Germany... and Pembrokeshire!

For the first few years of their lives, the Antars were operated by the Royal Army Service Corps (RASC), but, in 1965, the functions of the RASC were divided between the Royal Corps of Transport (RCT) and the Royal Army Ordnance Corps (RAOC). From this date, until the formation of the Royal Logistic Corps in 1993, the task of moving tanks fell to the two Tank Transporter Regiments of the RCT

The first of these, number 7 Tank Transporter Regiment, was based in West Germany, forming part of the British Army of the Rhine (BAOR). The regiment was headquartered at Sennelager, and comprised three companies, identified as numbers 3, 16 and 617 Tank Transporter Squadrons.

In 1965, number 3 Squadron was stationed at Sennelager, and had two troops, each with 20 Antar/trailer combinations – 'trains' in army parlance. 16 Squadron was based at St Barbara Barracks, Fallingbostel, with three Antar troops, each consisting of 20 trains. And, finally, 617 Squadron, formerly 317 Squadron, was based at

● Mk 3 Antar tractor (FV12004), complete with FV3011 50-ton semi-trailer loaded with a Chieftain main battle tank. Supplied in 1963, under contract WV/3484, the tractor (28ES12) was possibly the last Antar supplied to the Army.

● Line-up of eight Mk 2 (FV12002) fifth-wheel tractors complete with semi-trailers. The cobbled paving is typical of many of the German barracks used by units of the British Army of the Rhine (BAOR).

IN SERVICE

Cromwell Barracks, Hamm, and was also equipped with three Antar troops and 20 trains. The latter was described as 'mixed service organisation' (MSO) indicating that it was a civilian arm of BAOR which employed displaced persons, largely Poles and other east Europeans who had either chosen not to return home after the end of WW2, or who were unable to return. The MSO crews acted as drivers, clerks, mechanics and guards.

During peacetime, the tank transporter squadrons were involved in regimental training and annual brigade and divisional exercises, often using either the training area at Soltau or the Bergen-Hohne ranges.

The role of 7 Tank Transporter Regiment was considered to be extremely important and daily figures were compiled relating to the availability of the total holding of 160 tank-transporter trains. Should the Cold War have turned hot, one of the first actions of the British Army deploying to war was the use of 16 Tank Transporter Squadron to move 48 AVREs (armoured vehicle Royal Engineers), together with operationally-rigged Centurion and Chieftain AVLBs (armoured vehicle launched bridge) from their base at Munsterlager into the General Deployment Plan (GDP) of 1 British Corps on the assumption that the Warsaw Pact forces would have destroyed river crossings. Once this task was completed, the transporters would have returned to Sennelager to deploy the 'covering force' armour to forward locations. The transporters would have then moved westwards again to pick-up and deploy the armour that would comprise the BAOR's main defensive force. If time was short, the armour would have already started to move from the barracks on its tracks.

Had these tasks been successfully completed, and, in the event of a serious 'shooting war', the tank transporters would also have been used to recover battle-damaged tanks. These would have been carried west to allow REME (Royal Electrical and Mechanical Engineers) workshops to repair them, before recycling them back to the front.

Number 19, later number 414, Tank Transporter Squadron was, and still is, based at Ward Barracks, Bulford Camp in Wiltshire, and until about 1964, was equipped with Diamond T tractors, before these were superseded by Antars. From 1961, a major part of the Squadron's role was to move tanks between Pembroke Dock and the Castlemartin training area in the Pembrokeshire Coast National Park. At the time, Castlemartin, which is one of a number of major training areas in the UK, was used by West German tank units for long-distance live firing as part of a NATO agreement which allowed the British Army to continue to use the Bergen-Hohne Training Area in Germany.

● Mk 3 tractor, semi-trailer, and Chieftain tank that has come to grief in West Germany. Clearly, there was insufficient width of road to prevent the trailer wheels from sinking into the soft roadside margin during the turning manoeuvre.

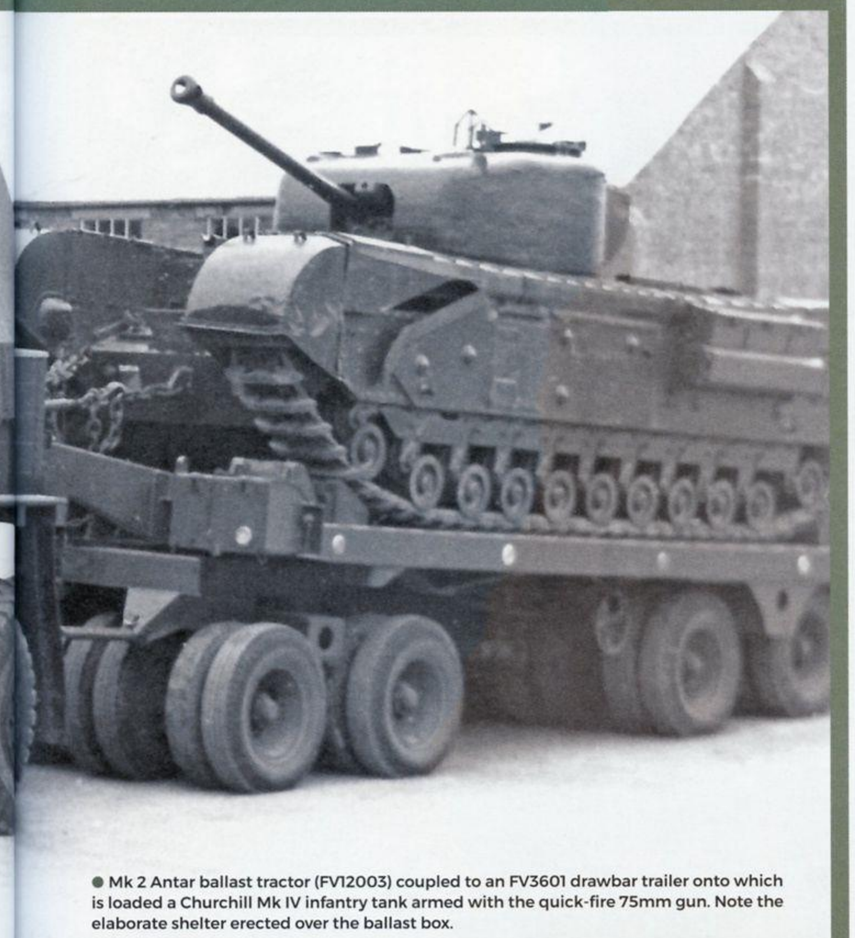
● Centurion dozer (FV4019) loaded onto an FV3001 60-ton semi-trailer. The tractor is a standard fifth-wheel Mk 2 (FV12002).

● Tank-transporter crews were often described as 'gypsies' on account of the amount of time spent away from base... and it's generally hard, dirty work. Spot the officer!

IN SERVICE

● A yard full of Antars and trailers... there are roughly 20 tractors here, all of them of the Mk 3 fifth-wheel configuration (FV12004); the semi-trailers are a mix of FV3001 and FV3011 types.

IN SERVICE



● Mk 2 Antar ballast tractor (FV12003) coupled to an FV3601 drawbar trailer onto which is loaded a Churchill Mk IV infantry tank armed with the quick-fire 75mm gun. Note the elaborate shelter erected over the ballast box.

Crew

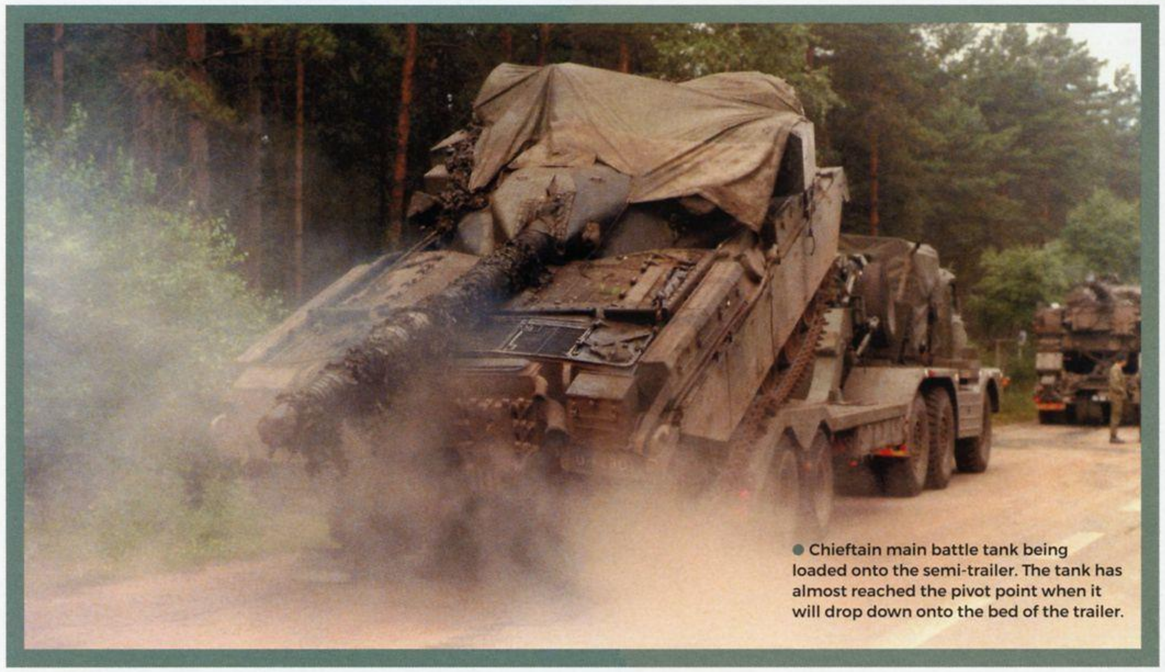
An Antar was operated by a crew of two. The first man was in charge of the tractor, driving it and carrying out routine running checks and light maintenance. Classified as an army tradesman – described as 'driver tank transporter' – he would also generally stay with the vehicle whenever it was away from its home base. The second crew member looked after the trailer.

Antar crew members were expected to sleep with the vehicle overnight, and a simple tarpaulin-covered shelter was often erected over the ballast box or winch to provide temporary accommodation for the men.

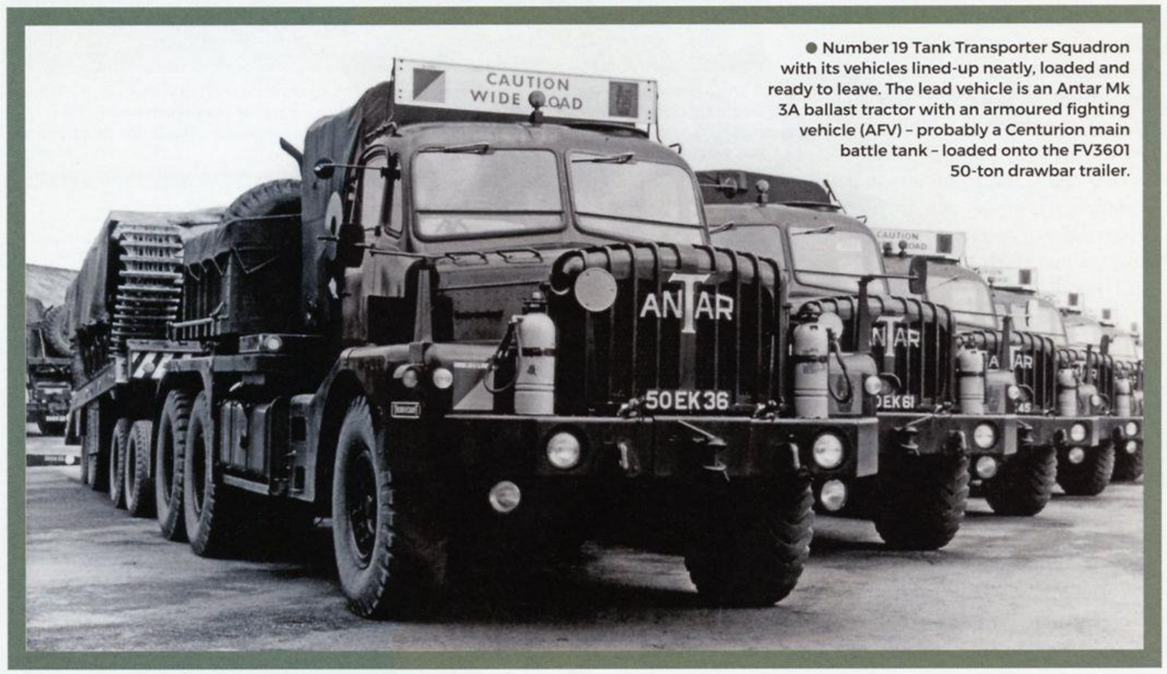
Loading

Loading a tank onto a transporter is something of an act of faith. Once the tank has started to climb the trailer ramps, the driver cannot see the trailer, and must follow the hand signals of the man stationed on the swan neck. Any misalignment must be corrected by reversing off the trailer and trying again: attempting to manoeuvre the tank once it is on the trailer will generally result in disaster. To avoid this, the tank driver was often asked to keep his hands outside of the tank to show that he was nowhere near the steering levers.

Disabled tanks must be winched onto the trailer. This is not an easy task if



● Chieftain main battle tank being loaded onto the semi-trailer. The tank has almost reached the pivot point when it will drop down onto the bed of the trailer.



● Number 19 Tank Transporter Squadron with its vehicles lined-up neatly, loaded and ready to leave. The lead vehicle is an Antar Mk 3A ballast tractor with an armoured fighting vehicle (AFV) – probably a Centurion main battle tank – loaded onto the FV3601 50-ton drawbar trailer.

there is battle damage preventing the tank from moving easily. And, similarly, unloading a casualty means winching it off using a second tractor, with a degree of control provided by the first tractor's winch to prevent the tank from running away.

Once loaded, the tank would be securely lashed in position at front and rear using turnbuckles.

On the road the security of the load and the trailer ramps would be checked every two to four hours. At the same time, the crew were able to check such things as the trailer tyres, the wheel nuts, the electrical and airline jumpers, and the hubs for over-heating.

● Antar Mk 3A (FV12006) tractor digs the rear wheels in as it drags a West German Leopard tank up a shallow incline. The Leopard 1 tank entered service in 1965 and troops were trained in live firing of its 105mm L/52 main gun at Castlemartin in Pembrokeshire.

On the road

Any route along which a loaded tank transporter is to move must be thoroughly reconnoitred beforehand, with the load-bearing performance of every culvert and bridge noted, as well as heights, turning circles, and width restrictions or other obstructions.

Once on the move, it is impossible to underestimate how slow the Antars were. The Mk 1 and Mk 2 tractors were not able to exceed 30mph (50km/h) and took a considerable time to reach their top speed. The Mk 3/3A was better, but not by much, and none of the trucks could reach the legal minimum speed on German motorways when climbing a grade. Rearward vision was very poor and a downside of the size – and weight – of the machine was the fact that the driver was often unable to feel any impact at the rear. It was not unknown for drivers of smaller, and faster vehicles to misjudge the slow speed of the Antar, to attempt to pull in behind, and to simply run into the back of the trailer... legend has it that at least three German civilian car drivers were killed in this way.

In West Germany, a convoy of Antars on the road, generally consisting of 20 trains, would be accompanied by one or two solo tractors, with one ballast-bodied tractor at the rear. In the event of a breakdown, the ballast tractor could be manoeuvred forward to clear the casualty to a safe place where the broken-down prime mover would be swapped for one of the spare tractors. A Land Rover would accompany the convoy, providing radio communications to the troop

● The Antar was not designed for off-road use, but Thornycroft claimed that the use of a lighter, undriven, front axle ensured that, when coupled to a loaded trailer, maximum weight was placed over the rear wheels where traction was required... nevertheless, this is not exactly what you would call rough going.

● One of the more unusual loads was two FV432 armoured personnel carriers, or others from the FV430 series, on a single 50-ton FV3011 semi-trailer.

● The recovery of a crashed Antar, particularly when coupled to a loaded trailer, is no easy task. This Mk 3 fifth-wheel tractor, fortunately with no load on the trailer, left the road, ending up at a precarious angle in a ditch... maybe the driver fell asleep or perhaps there was a mechanical failure.

● Mk 2 fifth-wheel tractor hauling a Conqueror prototype. With a battle weight of 63 tons (64 tonnes), the Conqueror was slightly overweight – and, for that matter, slightly over-width – for even the FV3001 60-ton semi-trailer.

● A short stack, consisting of three loaded Antars, together with two spare tractors, one with a fifth wheel, one with a ballast body. The warning board, 'Achtung – panzer transport' indicates that the ballast tractor will be running at the rear of the convoy.

● It was not always easy negotiating the sometimes narrow roads in small German towns.

commander, together with a REME aid detachment, consisting of tools and technicians. Four or five Triumph, or later, Honda, motorcycles would be used for traffic control.

Tyre blow-outs were to be expected on trailers – inevitably always one of the inner wheels – and, on at least the Mk 2 and 3/3A tractors a trailer puncture warning light was fitted in the cab. The trailers were provided with hydraulic jacks that were intended for steadying the trailer during the loading and unloading processes. The trailer jacks could also be used to lift the trailer to assist with changing a tyre... often, the road surface would not take the loading and the jack would punch a neat hole in the road, leading to a large bill for repairs from the local authority!

Road accidents with Antars were not common, but occasionally a driver might fall asleep at the wheel, or the edge of the road might give way and tip the trailer over... sometimes taking the tractor with it. Recovery was not an easy task, and generally involved using another Antar as a recovery tractor.

Dummy recovery axle

One of the drawbacks of the size and weight of the Antar was that it was

too heavy for any military recovery vehicle of the period to accommodate on suspended tow. In an effort to get around this problem, work started at Thornycroft in the early 1960s on the design of what was described as a 10/30-ton dummy axle recovery unit. Designated FV3561, the unit enabled one Antar to provide a suspended tow to another.

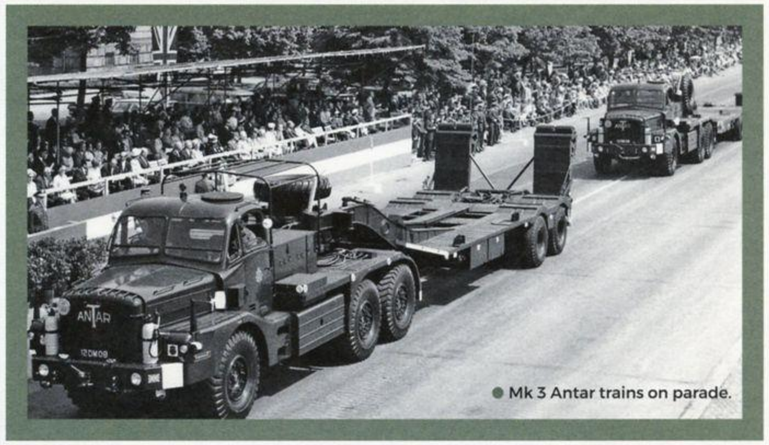
The unit consisted of a towed A-frame with a single unsprung axle, running on a pair of twin wheels; a girder crane mounted on the frame allowed a vehicle casualty to be hydraulically lifted at the front and secured on the A-frame. A small petrol (later, diesel) engine was provided to operate the hydraulic lifting system, and a towing eye was provided at the front end of the unit to allow the trailer to be coupled to a towing vehicle.

Although the prototype was shown at the FVRDE exhibition in 1966, when it was described as 'undergoing user trials', production did not get underway until 1971. Following the demise of Thornycroft in 1969, production passed to the Royal Ordnance Factory at Nottingham.

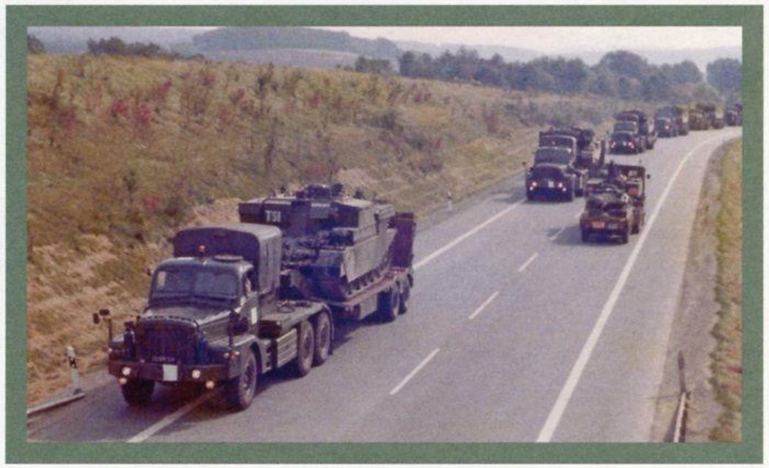
● The classic Antar tank-transporter train... Mk 3 tractor, and FV3011 50-ton semi-trailer.

● View across the decking of the FV3011 50-ton semi-trailer... clearly tractor 13DM13 is wearing the wrong cab cover! Note the tank guide rails on the trailer deck.

● Apparently brand-new Mk 3 tractor, finished in overall matt NATO green, 12DM36 was one of 150 tractors supplied during 1961.



● Mk 3 Antar trains on parade.

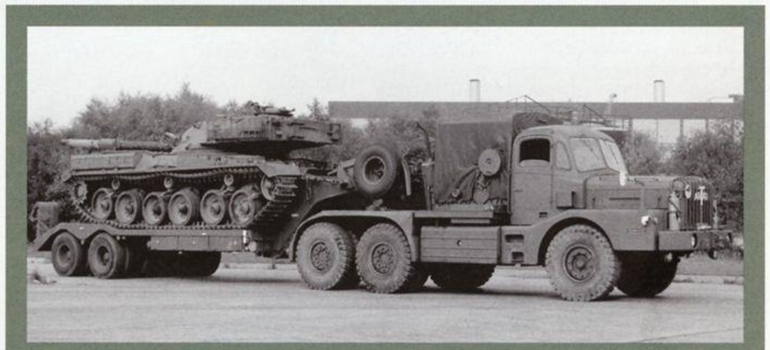


● A convoy of tank transporters is a pretty awe-inspiring sight... the more so if you are on a bridge watching it pass, rather than finding yourself trapped behind it! The lead tractor is hauling a Centurion armoured recovery vehicle (ARV).

● The stencilling on the driver's door indicates that this Mk 3A tractor (FV12006) is driven by Lance Corporal Michie; the trailer is the FV3601 50-ton drawbar design.

● Any of the standard Antar trailers, or semi-trailers, could be adapted for hauling dense stores, such as plant, or ammunition. Note that the crane forms part of the background and is not part of the Antar.

● Three Mk 2 fifth-wheel tractors (FV12002). The presence of Diamond Ts in the background suggests that these trucks have only recently been delivered.



● Chieftain main battle tank on the FV3011 50-ton semi-trailer. The tractor is a Mk 3 equipped for fifth-wheel operation.

● Using the winch on an Antar Mk 3 to recover an overturned tank; a second tractor is being used as an anchor to steady the tank during the recovery operation.

IN SERVICE

● Three Antars, one Mk 2 and two Mk 3 tractors, surrounded by typical vehicles of the early 'seventies, including products of AEC, Bedford, Foden, Land Rover, and Leyland/Scammell... plus a lone motorcycle.

● ABOVE The 'Tucker Jib' eventually went into production, with a hydraulic winch and a small diesel engine, as 'dummy axle, 10/30-ton; FV3561' Early production was by Thornycroft, and latterly at the Royal Ordnance Factory, Nottingham.

● LEFT The 'Tucker Jib' was devised as a means by which one Antar could recover another on suspended tow. The equipment could be simply bolted to any tractor to provide a heavy recovery vehicle.

● Mk 3A ballast-bodied tractor and FV3601 50-ton drawbar trailer.

● Another unusual load was this FV2721 'trailer, 7 ½ ton, four-wheeled, Centurion, AVRE (armoured vehicle Royal Engineers)' two of which could be carried by a single Antar. Hopefully, the occupant of the trailer will wake up before the convoy starts on the exercise.

● Centurion Mk 3 main battle tank being winched onto the FV3601 50-ton drawbar trailer. The tractor is one of the original Antar Mk 1 vehicles (FV12001) with a steel ballast body.

The equipment was made obsolete by the introduction of heavy-duty hydraulic recovery vehicles at the beginning of the 'eighties.

The end is nigh...

In Britain, the last Antar left Ward Barracks at Bulford Camp, the home of 414 Tank Transporter Regiment, on 30 January 1985. Loaded on the trailer of a Scammell Commander it was en-route for disposal at British Car Auctions.

In Europe, the last Antar in the British Army was a Mk 3 tractor decommissioned from 617 Tank Transporter Squadron that was demobbed on 31 March 1987. In line with Regimental policy the vehicle was put on permanent display at the Squadron's home base. The tractor has been named 'The Wladyslaw Paterek' after the much-respected father of the tank transporting MSO, who retired in 1987 after 40 years' service.

● Conqueror prototype number P2, heavily ballasted on the turret to simulate the weight of the completed tank. The semi-trailer is the standard 60-ton FV3001 coupled to an early Mk 2 tractor (FV12002).

● On the road again... Antar, trailer and Chieftain tank!

TYPICAL ANTAR LOADS

Vehicle		Description	Date into service	Notes
Gun tanks				
Caernarvon	FV221	medium gun tank; 17 pounder gun	1950	development only
Centurion	FV4000	main battle tank; 17 pounder 20 pounder, 105mm gun	1945	
Charioteer	FV4101	tank destroyer; 20 pounder gun	1952	
Chieftain	FV4201	main battle tank; 120mm gun	1959	
Churchill	A22	infantry tank; 75mm, 95mm	1941	WW2 relic
Comet	A34	cruiser tank; 77mm gun	1944	
Conqueror	FV214	heavy gun tank; 120mm gun	1948	
Conway	FV4004	tank destroyer; 120mm gun	1950	trials only
Engineer tanks				
Centurion ARK	FV4016	armoured ramp carrier	1963	
Centurion ARV	FV4006	armoured recovery vehicle	1956	
Centurion AVRE	FV4003	armoured engineers' vehicle	1963	
Centurion BARV	FV4018	beach armoured recovery vehicle	1960	
Centurion bridge layer	FV4002	armoured vehicle launched bridge	1960	
Centurion dozer	FV4019	armoured bulldozer	1962	
Chieftain ARRV	FV4204	armoured repair and recovery vehicle	1974	
Chieftain bridge layer	FV4205	armoured vehicle launched bridge	1974	
Churchill ARK Mk 2	-	armoured ramp carrier	1944	
Churchill AVRE	FV3903	armoured engineers' vehicle	1954	
Churchill flail	FV3902	mine clearance	1956	training only
Conqueror ARV	FV219, FV222	armoured recovery vehicle	1953	
Sherman BARV	-	beach armoured recovery vehicle	1944	
Artillery				
Abbot	FV433	self-propelled gun; 105mm	1965	
Archer	-	tank destroyer; 17 pounder	1944	
M107		self-propelled gun; 175mm		
M109		self-propelled gun; 155mm		
M110		self-propelled gun; 8in		
Sexton	-	self-propelled gun; 25 pounder	1943	
Other vehicles				
AVRE trailer	FV2721	trailer, cargo, 7 1/2 ton, 4 wheeled	1962	loaded two up
FV430 series	FV432, etc	armoured personnel carrier, command post, etc	1963	loaded two up

In Germany, Antars were also used for moving Warsaw Pact armour, borrowed from the US Army, to show to BAOR 1 Corps.

● US Army 175mm M107 self-propelled gun, loaded onto the FV3011 semi-trailer and coupled to a Mk 2 fifth-wheel (FV12002) Antar tractor. The M113 gun was a powerful weapon but rather heavy on the life of the barrel.

WILL IT FIT MY GARAGE?

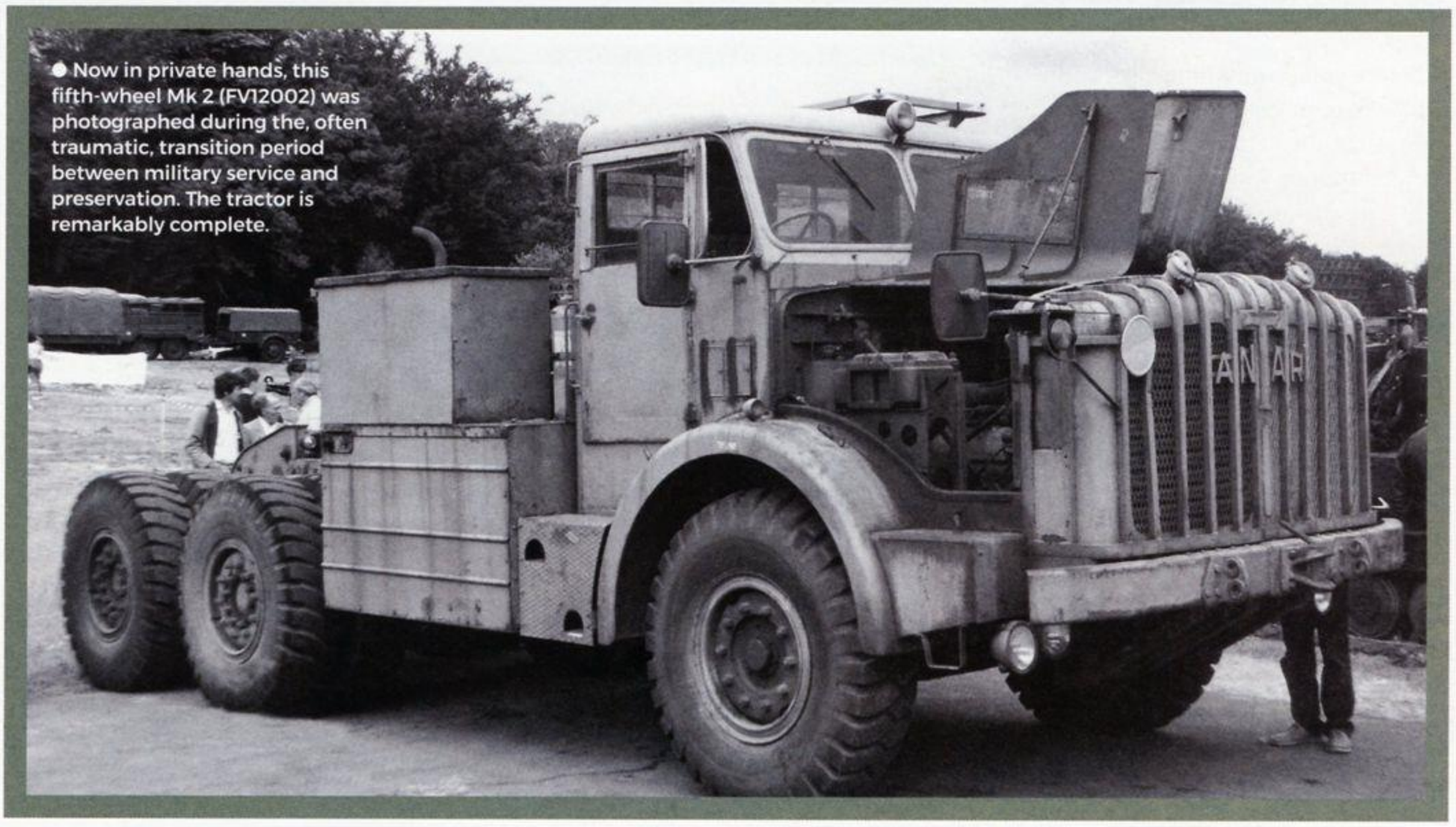
The Antar in preservation

If you need to ask, the answer is almost certainly a resounding 'no' The Antar is huge... as an example, the Mk 3/3A measures up at 342in (8693mm) in length, 126in (3200mm) in width, and is 122in (3098mm) to the top of the cab. And that's before even considering that the beast weighs around 23 ton (23.4 tonne) in its stockinged feet! Nevertheless, a handful of Antars have survived in private hands, some with museums and others with enthusiasts... one example has even had a Rolls-Royce Eagle diesel engine shoehorned under the bonnet in place of the original petrol engine, giving considerable improvement in top speed.

Some amazing work has been done in restoring Antars to better than new condition, but don't underestimate the size and weight of the components... you will also need some serious tools, and, just to add to the pain, parts are not going to be easy to find.

Nor, for that matter, underestimate the difficulty of actually finding an Antar for sale. The number in private hands – as opposed to being in museums – is very small, but, there are certainly examples of all three marks. And, on the plus side, owning an Antar makes you a member of a small and exclusive club. Keep a close eye on *www.milweb.net* and consider joining the Thornycroft Register (*www.thornycroft.org.uk*).

● 15.5 tons (15.78 tonne) of Antar Mk 1 with steel ballast body (FV12001). This vehicle, now preserved and forming part of the REME historic collection, is a regular on the show scene, and is one of just 15 supplied under contract 6/Veh/5718 in 1951.



● Now in private hands, this fifth-wheel Mk 2 (FV12002) was photographed during the, often traumatic, transition period between military service and preservation. The tractor is remarkably complete.

PRESERVATION

● Photographed whilst still in service... this Antar Mk 2 fifth-wheel tractor (FV12002) has a Chieftain main battle tank loaded onto the FV3001 60-ton semi-trailer... what more could you want?

Before you do anything else, find somewhere to keep it under cover... and then enlist the help of three or four like-minded friends who can act as a team to help with maintenance.

Legal issues

A little time spent browsing the various government sites on the internet amply demonstrates the difficulties of taxing and testing large, non-standard vehicles. However, it would appear that a privately-owned Antar can be registered and taxed in the taxation class 'private HGV' (tax class 10), with annual road tax of £165; see DVLA form 149.

The dimensions and weights of vehicles used on British roads are regulated by the '*Road vehicles (construction and use) regulations 1986*', and the '*Road vehicles*

● Powered by a Rolls-Royce C6 diesel engine, this Antar R6 tractor, ex-RAF (40AT81), was a regular at the bigger military-vehicle shows for many years.

● Antar Mk 3, complete with loaded semi-trailer, dwarfs the FV1801 Austin Champ. The Antar was one of possibly three tractors supplied under contract 6/Veh/27469 in 1959. The photograph is familiar to many by virtue of having illustrated the index to Bart Vanderveen's '*Wheels & Tracks*' magazine.

● Big boy's toys... Antar Mk 3 alongside the Rolls-Royce B81 petrol-engined Leyland Martian artillery tractor (FV1103). One of just 60 similar vehicles, the Martian dates from the early 'fifties, and, like the Antar, was also produced in versions for the civilian market.

● White-coated representatives of the Fighting Vehicles Inspectorate make detailed checks on a near-completed Antar Mk 3 tractor.

● Well-restored, privately-owned Mk 2 ballast-bodied tractor (FV12003).

The Conqueror tank-killer is shown here on a huge tank transporter. The transporter is a semi-trailer articulated to the 250 h.p. Mighty Antar tractor vehicle used by the Royal Engineers.

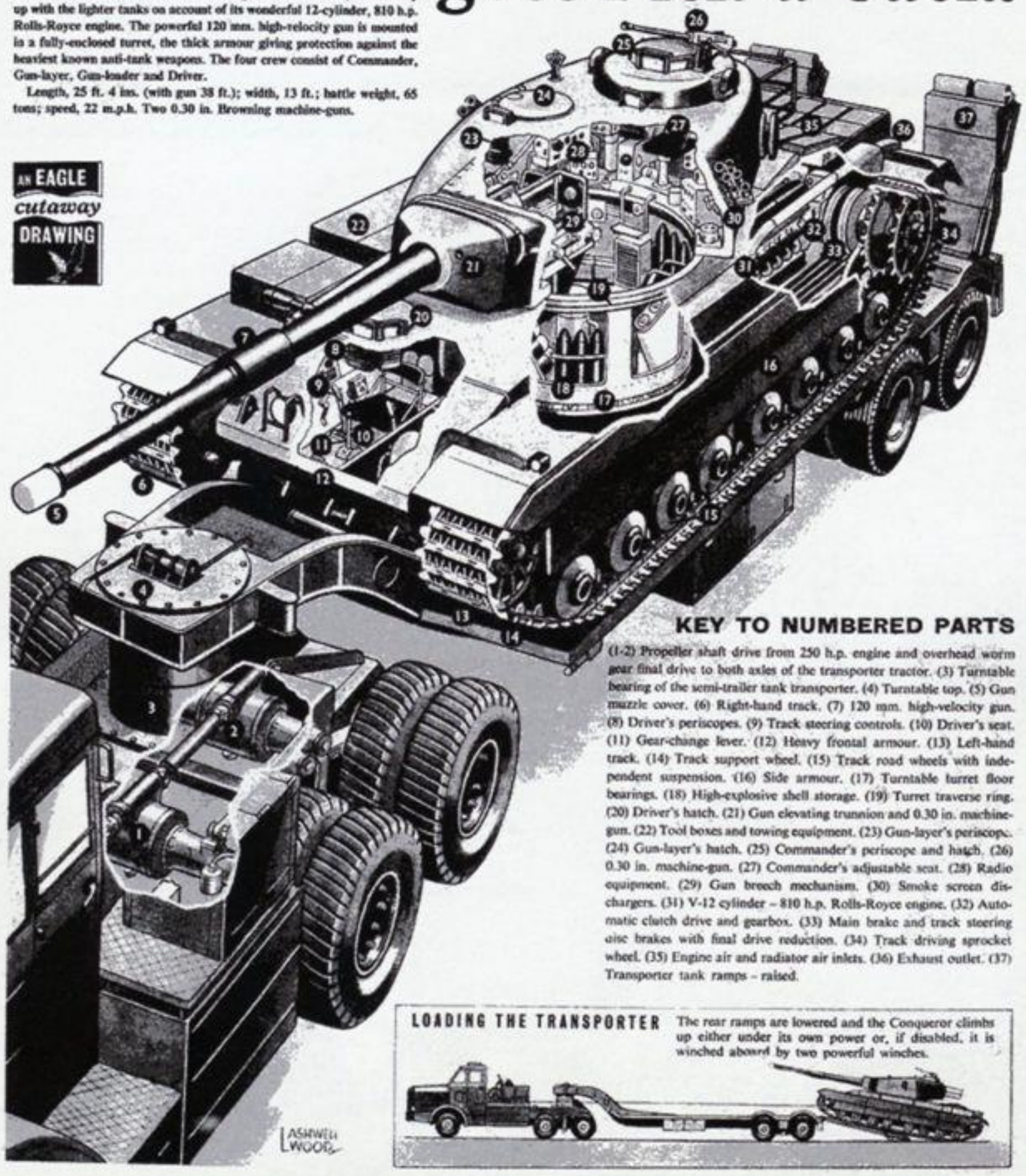
Transporters are used to convey tanks from one place to another quickly and to prevent damage to road surfaces. They are also used for recovery of damaged tanks and as a breakdown service.

The Conqueror is a 65-ton monster and one of the heaviest tanks in the world. Its tactical role is basically to provide heavy fire support for the Centurion tank and to act as a tank-killer. The Conqueror would follow the Centurion into battle. Although 15 tons heavier, it can keep up with the lighter tanks on account of its wonderful 12-cylinder, 810 h.p. Rolls-Royce engine. The powerful 120 mm. high-velocity gun is mounted in a fully-enclosed turret, the thick armour giving protection against the heaviest known anti-tank weapons. The four crew consist of Commander, Gun-layer, Gun-loader and Driver.

Length, 25 ft. 4 ins. (with gun 38 ft.); width, 13 ft.; battle weight, 65 tons; speed, 22 m.p.h. Two 0.30 in. Browning machine-guns.

The Conqueror goes Pick-a-back!

AN EAGLE *cutaway* DRAWING



KEY TO NUMBERED PARTS

(1-2) Propeller shaft drive from 250 h.p. engine and overhead worm gear final drive to both axles of the transporter tractor. (3) Turntable bearing of the semi-trailer tank transporter. (4) Turntable top. (5) Gun muzzle cover. (6) Right-hand track. (7) 120 mm. high-velocity gun. (8) Driver's periscopes. (9) Track steering controls. (10) Driver's seat. (11) Gear-change lever. (12) Heavy frontal armour. (13) Left-hand track. (14) Track support wheel. (15) Track road wheels with independent suspension. (16) Side armour. (17) Turntable turret floor bearings. (18) High-explosive shell storage. (19) Turret traverse ring. (20) Driver's hatch. (21) Gun elevating trunnion and 0.30 in. machine-gun. (22) Tool boxes and towing equipment. (23) Gun-layer's periscope. (24) Gun-layer's hatch. (25) Commander's periscope and hatch. (26) 0.30 in. machine-gun. (27) Commander's adjustable seat. (28) Radio equipment. (29) Gun breech mechanism. (30) Smoke screen dischargers. (31) V-12 cylinder – 810 h.p. Rolls-Royce engine. (32) Automatic clutch drive and gearbox. (33) Main brake and track steering disc brakes with final drive reduction. (34) Track driving sprocket wheel. (35) Engine air and radiator air inlets. (36) Exhaust outlet. (37) Transporter tank ramps – raised.

LOADING THE TRANSPORTER

The rear ramps are lowered and the Conqueror climbs up either under its own power or, if disabled, it is winched aboard by two powerful winches.

LASHWELL WOOD

● In its original incarnation, '*The Eagle*' comic was first published between 1950 and 1969. Alongside such favourites as '*Dan Dare - Pilot of the Future*', each issue also featured a full-colour centre-spread cutaway illustration of a piece of machinery. Seen here is '*The Eagle's*' illustrator's take on the Antar, semi-trailer and Conqueror.

(authorised weight) regulations 1998' According to the first of these two documents, the maximum permissible width for a vehicle on British roads is normally 100in (2.55m). Any vehicle larger than this, and an Antar tractor is most decidedly wider than this, needs to be accompanied by a pilot vehicle and to display 'wide load' warning signs.

As regards weight, the heaviest Antar, solo, is in the order of 23 tons (23.4 tonne) which falls below the requirements of the '*Road vehicles (authorisation of special types) (general) order 2003*' (STGO). But, if you're planning on towing a loaded trailer, there will be further hoops to jump through, and legislation requires that vehicles and load movements that exceed the standard dimensions need to be pre-notified to the police, the Highways Agency and any bridge authorities. Get hold of a copy of '*Code of practice: lighting and marking for special order, VR1, STGO and C&U loads*', published by Highways England in 2016.

You will also need to ensure that you have the appropriate driving licence; see DVLA information booklet INF 52 '*Large Vehicles you can drive using your car or lorry licence*'

On the road

Driving a vehicle as large as the Antar is not an exercise to be undertaken lightly... Roger Jones, curator at the REME Museum, described it as 'a nightmare' back in 1995 and 'not something to be undertaken for fun' Strangely, there are others who would disagree with him!

If you are seriously planning to drive the beast on the public highway, consider whether it might be sensible to first of all undertake some commercial-vehicle driver training to improve your spatial awareness and manoeuvring skill.

And don't even think about the cost of recovering the beast after a breakdown... it probably won't be much good trying to use your AA card!

Off the road!

The Antar has no serious off-road capabilities, but, let's face it, no privately-owned Antar is going to spend a lot of time off the road, or for

● Dusty, and a trifle 'two-tone' in appearance, this Mk 3 Antar is basically sound and complete and is now in private hands following a 20-year service career.

● Antar Mk 3 fifth-wheel tractor painted in overall matt green.

● Well-restored and beautifully-presented Antar Mk 3 fifth-wheel tractor (FV12004).

● Mk 2 fifth-wheel tractor displaying the STGO Category 3 warning, indicating that the vehicle does not meet the road traffic '*Construction and use regulations*'.

● Mk 3A ballast tractor and drawbar trailer, taking up an awful lot of space in a roadside lay-by.

● Two Antars and an Austin Champ make a roadside stop... 'somewhere in Germany'.

● The colour and finish, the position of the fuel tank, and the inclusion of paying-on gear for the winch suggest that this is not a standard MoD Mk 2 military Antar, nor is it one of the Snowy Mountains tractors. However, we do know that it was photographed close to the Basingstoke factory.

that matter on it... and it isn't just the matter of single digit fuel consumption. Whilst writing this piece, I approached an Antar-owning friend, asking him about actually driving the machine. He has owned his truck for more than five years, but in response to my enquiry about running it he replied that when he bought it 'the steering was broken and, since fixing it, about five years ago, it's only been round the field a couple of times'

It may well be that the standard fate of a privately-preserved Antar is to sit inside a shed looking huge, imposing... and glorious and to make the odd journey to a military-vehicle show where it will be admired for its sheer size!

● Looking after an Antar is not a commitment to be undertaken lightly and is best considered by a small consortium, or team, of part-owners.

● A pair of Mk 3 tractors closest to the camera, with a pair of Mk 2s behind, both of the latter with coupled semi-trailers. Having the benefit of a well-equipped workshop would certainly help to alleviate some of the pain associated with owning a truck of this size.

● With an overall width of 126in (3200mm) and a height to the top of the cab of 122in (3098mm), the Antar is not easy to accommodate... an agricultural barn probably makes the perfect storage facility.

● Surprisingly, the RAC offers breakdown cover for vehicles up to 44 tons (45 tonne) in weight, with a choice of payment options... getting caught out, without the benefit of such insurance, or of a REME light aid detachment, behind you, will be an expensive business.

● Although photographed at a show of some description, this Mk 3 tractor, dating from 1961, and the semi-trailer onto which is loaded a Centurion tank, remains in military service.

Models

For those enthusiasts who may lack the necessary garage space, and who are also of slender means, the only practical way to get your hands on an Antar is to buy a scale model.

Dinky Toys number 660 provides an approximation of the Mk 2 fifth-wheel tractor, but it is very obviously no more than a toy; and for those who prefer a civilian model, there's Dinky Toys number 908, or Dinky Toys number 986. The Italian company Politoys produced an Antar Mk 2 tractor and semi-trailer that was very similar to the Dinky toy. There's also a diecast Matchbox toy (Matchbox Major number 3) supplied complete with a fifth-wheel trailer and a Centurion tank... also available as part of Matchbox gift set G5. And Langley Models offer a slightly-crude ballast-bodied Antar in OO gauge (1:76), under the product number G188A.

There's a very attractive Mk 3 with ballast body available from ASAM Models (*www.asam.co.uk*), coded SM103. The model is produced in resin and metal and includes considerable detail at a scale of 1:48. And Shapeways (*www.shapeways.com*) offer a 1:144 scale Mk 2 tractor and semi-trailer.

But, by far the best of the bunch is probably the range of Antar tractors, in all three marks, produced as 1:35 resin kits by Accurate Armour. Sadly, although appearing on the company's website (*www.accurate-armour.com*), these kits do not seem to be available at present.

● Dinky Toys number 660; for those who might prefer a civilian model, there's Dinky Toys number 908, or number 986. Although very obviously no more than a die-cast toy, that's part of the charm of these models.

● Matchbox Toys Antar tank transporter and Centurion Mk 3 tank.

● The range of superb 1:35 resin kits, produced by Accurate Armour (*www.accurate-armour.com*), includes models in all three marks... this is the Mk 2 ballast tractor (FV 12003).

● Climbing onto the beast for the first time is not an easy task... there are foot and handholds to assist but, nevertheless, it's quite a stretch.

THE FINAL WORD

What's in a name...?

Antar was derived from the pre-Islamic Arabian poet warrior, Antar – sometimes Antarah – Ibn Shaddad (AD 525-608). Famed for both the beauty of his poetry, and his considerable powers of strength and endurance in battle, his work is apparently still said to be recited by traditional story-tellers in Arab coffee houses.

And, although it seems unlikely, it has been suggested that the choice of an Arab name was a deliberate attempt to curry favour with the Iraq Petroleum Company... oh, surely not!'

● 'Antarah Ibn Shaddad' otherwise known as 'Antar' was a pre-Islamic Arab knight and poet, famous for both his poetry and his adventurous life... an incongruous connection between the arts of poetry and war!

● Sheer poetry! Ground-level rear view of the Mk 2 fifth-wheel tractor (FV12002)... an impressive sight, for sure, but, with a maximum speed of just 28mph (45.5km/h), perhaps not one you'd like to encounter in front of you when in a hurry.

READER SPECIAL

GET 6 ISSUES FOR JUST £20!

WHEN YOU SUBSCRIBE TO OLD GLORY TODAY

DON'T MISS OUT - ORDER TODAY!

SIMPLY VISIT OUR SECURE STORE
SHOP.KELSEY.CO.UK/OGT20

OR CALL **01959 543 747***
QUOTE OFFER CODE: **OGT20**

*LINES OPEN MON-FRI 8.30AM-5.30PM. CALLS CHARGED AT YOUR STANDARD NETWORK RATE

MILITARY TRUCKS ARCHIVE

DON'T MISS THE NEXT ISSUE OF THIS STUNNING NEW SERIES

SCAMMELL PIONEER

Just as there are a handful of iconic motorcars, so too there is a handful of trucks that exert the same emotional pull. With its appetite for hard work and rugged no-nonsense appearance, the Scammell Pioneer is one such machine. Slow and cumbersome, even for its time, the Pioneer lacked creature comforts - and front wheel brakes - but, my goodness it was unstoppable!

The Pioneer was trialled in the tank transporter role in 1932 but it was to be another five years before it entered service. Ultimately more than 500 examples went into service with the British Army.

DON'T MISS THIS FASCINATING STORY ON SALE 24 APRIL 2020